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Continuous Release—Emergency Response Notification System and Priority Assessment Model

User's Manual for EPA Regions

Office of Emergency and Remedial Response (OS-210)
U.S. Environmental Protection Agency
Washington, DC 20460

The policies and procedures set forth here are intended as guidance to Agency and other government employees. They do not constitute rulemaking by the Agency, and may not be relied on to create a substantive or procedural right enforceable by any other person. The Government may take action that is at variance with the policies and procedures in this manual.

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1. INTRODUCTION

1.1 Overview

The purpose of this User's Manual is to provide EPA Regional personnel with information and detailed instructions on how to use the U.S. Environmental Protection Agency's (EPA) Continuous Release-Emergency Response Notification System (CR-ERNS) and Priority Assessment Model (PAM). CR-ERNS and PAM were developed to assist EPA Regional personnel in implementing the new continuous release reporting regulations (55 FR 30166; July 24, 1990). The continuous release reporting regulations became effective on September 24, 1990, and are codified at 40 CFR §302.8. These regulations allow reduced reporting for certain releases of hazardous substances that equal or exceed a reportable quantity (RQ) in a "continuous" and "stable" manner. In the final rule, a "continuous" release is defined as any release that occurs without interruption or abatement or that is routine, anticipated, intermittent, and incidental to normal plant operations or treatment processes. A release is "stable in quantity and rate" if the release is predictable and regular in amount and rate of emission.

CR-ERNS/PAM is a wholly integrated database management system and screening-level risk assessment model that can operate on EPA Regional local area networks (LANs) or stand-alone personal computers. CR-ERNS is a central depository for all continuous release information received by the EPA Regions; PAM is a computerized risk assessment model that uses information stored in CR-ERNS to derive risk estimates.

CR-ERNS has been designed to manage all of the required reports that may be submitted by industry in complying with the continuous release reporting regulations. Using CR-ERNS, EPA can track continuous release reports, view and print these reports, and send copies electronically to the national database located at the Department of Transportation (DOT) Transportation System Center (TSC).

PAM, which is wholly integrated into CR-ERNS, is a screening level risk assessment model that uses continuous release information submitted by facilities, along with toxicological, physical, chemical, and environmental data contained within CR-ERNS, to estimate the level of threat posed by each continuous release. Based on this information, PAM categorizes each continuous release according to its relative threat to public health and the environment, using CR-ERNS "traffic light" categories of red, yellow, and green. By separating the reports received into categories that reflect their relative priority, Regional personnel can more easily focus their limited resources on responding to the most serious continuous releases first.

EPA Regions may receive a large influx of continuous release reports as a result of the continuous release reporting regulation. It is important that these reports receive attention as part of the overall CERCLA release assessment process. Each continuous release should be reviewed, and those releases that do pose a threat to human health and the environment should receive a response by the government or a responsible agency. CR-ERNS and PAM will assist Regional Superfund personnel in tracking, managing, and evaluating continuous release reports submitted to EPA pursuant to these requirements, and in determining the need for a federal response action.

CR-ERNS has been designed to operate in each of the ten EPA Regional Offices and at the TSC. The national CR-ERNS database, located at the TSC, will contain copies of all continuous

release information received nationally. In addition to maintaining the national CR-ERNS database, TSC receives electronic transmissions of initial telephone notifications made to the National Response Center (NRC). CR-ERNS incorporates an automatic communications feature to allow transmission of continuous release information between the Regions and the TSC national database.

1.2 Overview of Continuous Release Implementation Materials

This User's Manual is one of several documents that EPA has prepared to facilitate Regional implementation and industry compliance with the continuous release reporting regulation. The Agency has prepared guidance documents both for EPA Regional staff, to assist them in implementing these new regulations, and for facility personnel, to assist them in complying with these reporting requirements. This CR-ERNS/PAM User's Manual focuses solely on explaining how to use CR-ERNS/PAM at the software level; it does not provide general guidance or policy interpretations of the continuous release reporting requirements. Regional personnel should consult the Regional guidance materials described below for a detailed explanation of the continuous release reporting regulations and the PAM exposure and risk assessment methodology.

Two documents have been prepared for Regional staff, in addition to this CR-ERNS/PAM User's Manual, to assist them in interpreting the continuous release reporting requirements and in using PAM:

- **"Assessing Reports of Continuous Releases of Hazardous Substances: A Guide for EPA Regions,"** Office of Emergency and Remedial Response, OSWER Directive No. 9360.7-04, October 1990. This document provides a comprehensive explanation of the new continuous release reporting requirements. It outlines the Agency's responsibilities under the regulation, and discusses the industry requirements in detail.

- **"Continuous Release-Emergency Response Notification System (CR-ERNS) and Priority Assessment Model (PAM): Model Documentation,"** Office of Emergency and Remedial Response, OSWER Directive No. 9360.7-03, October 1990. This manual documents the mathematical approach and data sources used by PAM to evaluate potential threats posed by continuous releases. Regional personnel should consult this document in order to understand how to interpret results from PAM.

The Agency has also prepared outreach materials to provide assistance to industry in complying with the continuous release reporting regulations:

- **"Reporting Requirements for Continuous Releases of Hazardous Substances: A Guide for Facilities and Vessels on Compliance,"** Office of Emergency and Remedial Response, OSWER Directive No. 9360.7-01, October 1990. This Facility Guide provides a detailed explanation of the continuous release reporting regulations for industry, including an extensive question and answer section. Its purpose is to assist industry personnel in understanding their reporting responsibilities under the continuous release reporting regulation.

- **"Continuous Release-Emergency Response Notification System (CR-ERNS) Industry Diskette."** EPA is making available an industry version of CR-ERNS to allow facilities to report using a personal computer and to submit written continuous release

notifications on floppy diskettes. This system will facilitate proper reporting by industry and will reduce the Regional workload involved in entering continuous release reports in CR-ERNS.

- **"Continuous Release-Emergency Response Notification System: User's Manual for Industry,"** Office of Emergency and Remedial Response, OSWER Directive No. 9360.7-02, October 1990. This Industry User's Manual explains how to use CR-ERNS to submit continuous release notifications on computer diskettes.

The preamble and final rule for reporting continuous releases have been distributed to each Regional Office. It is likely that industry will ask EPA Regional personnel many questions about the continuous release reporting requirements. To minimize the burden on the Region, feel free to refer callers to the RCRA/Superfund Hotline at (800) 424-9346 (in Washington D.C., (202) 382-3000) for answers to questions concerning the final rule. For further guidance on how to facilitate compliance with the continuous release reporting requirements, Regional personnel are encouraged to consult the Guide for EPA Regions. To obtain copies of these documents, contact the Superfund Information Center at FTS-8-475-8864.

1.3 Who to Contact with Questions on CR-ERNS

CR-ERNS has been developed by EPA's Emergency Response Division (ERD), in coordination with the TSC and the NRC. Should you encounter difficulties operating the system or have questions concerning its use, please contact Pamela Russell-Harris (ERD) at the following address:

- Pamela Russell-Harris
  Emergency Response Division
  Office of Emergency and Remedial Response
  FTS-475-9815

If your questions concern communications with TSC information transfer issues, it may be appropriate for you to contact Robert Walters at the TSC:

- Robert Walters
  Transportation Systems Center
  Department of Transportation
  FTS-494-2626

1.4 Organization of this Document

This CR-ERNS/PAM User's Manual provides step-by-step instructions to assist Regional personnel in using the CR-ERNS/PAM system. It has been organized functionally to provide information on the specific activities that OSCs and other Regional staff will be performing most often with CR-ERNS/PAM:

- Getting started;
- Entering continuous release notifications manually;
- Loading continuous release notifications from industry disks;

- Using the Priority Assessment Model (PAM);
- Generating reports;
- Data communications; and
- Utilities and System Administrator functions.

The User's Manual has been designed to be used while actively working with CR-ERNS/PAM on the computer screen. It includes many graphic illustrations of the actual computer screens the user will see. Many users will want to work through each chapter of this User's Manual while on-line; others may just want to consult this manual when stuck. In either case, the graphic illustrations of the computer screens should make it easy for users to maneuver effectively within CR-ERNS/PAM.

2. GETTING STARTED

This chapter provides introductory information on CR-ERNS/PAM to assist users during their first sessions. It explains how to begin using CR-ERNS/PAM from the Main Menu, describes some standard keyboard conventions to help you use CR-ERNS/PAM more effectively, and explains how to get on-line system HELP.

2.1 Entering CR-ERNS and Using the Password System

To begin using CR-ERNS, select the "**CR-ERNS**" option from your Automaxx menu screen. If the system has not been installed on your Automaxx menu, type "**CRERNS**" at the DOS prompt in the directory containing the CR-ERNS program. Once you have called the CR-ERNS program, the computer will display a password entry screen. To enter CR-ERNS, you must type in your name and password according to the spelling and format specified by your CR-ERNS System Administrator. Once you have entered your name and password correctly, the system will display the main menu screen described below. If you do not enter your password information correctly, the system will allow you two additional chances before exiting from the password entry screen. Read Chapter 8 (Utilities and System Administrator Functions) for an explanation of how the System Administrator can create CR-ERNS passwords for designated staff.

2.2 Understanding the Main Menu

Upon entering CR-ERNS, the user will see the Main Menu illustrated in Exhibit 2.1. The main system functions are depicted at the top of the menu. To access any of these functions, either move the cursor to the appropriate option and press the **<Enter>** key, or press the first letter of the desired option (such as **<R>** for the "**Reports**" function). Each of the primary system options on the Main Menu is described below.

System: This menu function allows the user to view basic information about CR-ERNS, learn about on-line system HELP, perform calculations using the Pop-Up Calculator, use the Appointment Calendar, or exit CR-ERNS. HELP can be accessed at any point in CR-ERNS by pressing the **<F1>** key; the Pop-Up Calculator can be called up at any point in CR-ERNS by pressing the **<Shift>-<F1>** keys. When you are finished using CR-ERNS, or want to take a break, you can exit the program by pressing the **<Ctrl>-<Q>** keys from the Main Menu. You may also exit by selecting the "**System**" option on the Main Menu and then selecting the "**Quit**" option. Upon existing CR-ERNS, the user will be returned to the Automaxx menu screen or the DOS prompt.

Add/Edit: This menu option allows the user to view initial telephone notifications and SSI Reports, and to manually enter written reports received from facilities in hardcopy form. The user must select this menu choice for all manual data entry activities.

Reports: This menu option allows the user to view and/or print various system reports. CR-ERNS can print copies of all reports submitted by a facility, print status reports for individual facilities, print summary and detailed reports from PAM evaluations, and call Relational Report Writer to generate customized continuous release status reports.

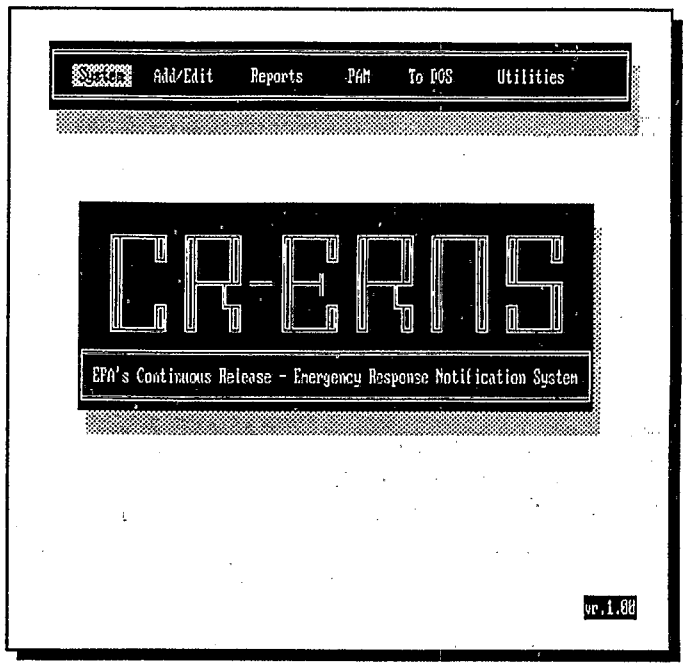
PAM: Users access the Priority Assessment Model (PAM) through the PAM menu option. From this option, Regional personnel can select which facilities to evaluate with PAM, run PAM, and alter the

default assumptions used by PAM to generate red, yellow, and green evaluation flags.

To DOS: This menu option allows the user to temporarily exit CR-ERNS and access the computer operating system (DOS). The user can then review documents on a word processing program or look at data on a spreadsheet before returning to CR-ERNS.

Utilities: The **"Utilities"** function allows users to perform many operations with CR-ERNS. From this menu, the System Administrator can specify the correct printer, set the default drives and directory paths, backup and restore data, and reindex system files. This menu also contains the communications package for sending and receiving information to/from TSC. Finally, it contains the **"Upload/Download"** option that allows Regional personnel to enter continuous release reports submitted on CR-ERNS industry diskettes.

Exhibit 2.1
CR-ERNS Main Menu



2.3 How to Get HELP From CR-ERNS

To get HELP from CR-ERNS anywhere in the system, press the **<F1>** key. The user will receive HELP concerning the highlighted data element. When finished, press the **<ESC>** key to exit. **NOTE: If you DO NOT find the answer to your problem or question, contact the System Administrator.**

2.4 Keyboard Conventions Used by CR-ERNS

CR-ERNS employs several standardized keyboard conventions to make the system more easy to use. With these conventions, certain keys on the keyboard will act in the same manner every time they are pressed. These conventions allow the user to become familiar with the software quickly, minimizing the time needed to learn how to use the system. In addition to providing consistent functions for certain keys, CR-ERNS indicates at the bottom of each display which keys are relevant to the current screen. The default values of these keys are explained below and summarized in Exhibit 2.2.

Adding/saving data: To add new data, press the **<F9>** key. After you have entered all the information for a portion of a report, you can save the information by pressing the **<F10>** key.

Moving through the menus: To access a menu option on any system screen, use the cursor to move to the desired entry and press the **<Enter>** key. To move further into each record ("down a level" or into more detail), press the **<F4>** key. To back out of a record ("up a level" or reducing detail), or to terminate an activity, press the **<ESC>** key.

Making a comment: CR-ERNS will let the user add comments to a report at any time except at the Main Menu. This feature is accessed by pressing the **<F8>** key. Once you have finished adding comments, proofread them, and press the **<Ctrl>-<W>** keys. The system will save the comment and return the user to the place where he/she asked for the comment feature. Pressing the **<ESC>** key will return the user to the original screen and the comment will not be saved.

Getting HELP: HELP can be accessed any time from any point in the program by pressing the **<F1>** key. HELP will provide information specific to the current entry field. Read the information that HELP provides; when ready, press the **<ESC>** key to return to the current entry screen.

Exiting: To exit CR-ERNS, press the **<Ctrl>-<Q>** keys.

Exhibit 2.2
CR-ERNS Keyboard Conventions

Key	Action
<Enter>	View or edit a portion of a record.
<ESC>	"Back-up" one level; aborts current function without saving changes.
<F1>	Activates Help from anywhere.
<F4>	"Move down" one level, or into more detail
<F6>	Sizes windows used to enter/edit data
<F7>	Moves windows used to enter/edit data
<F8>	Activates comments screen from anywhere
<F9>	Add new data
<F10>	Saves data or edits.

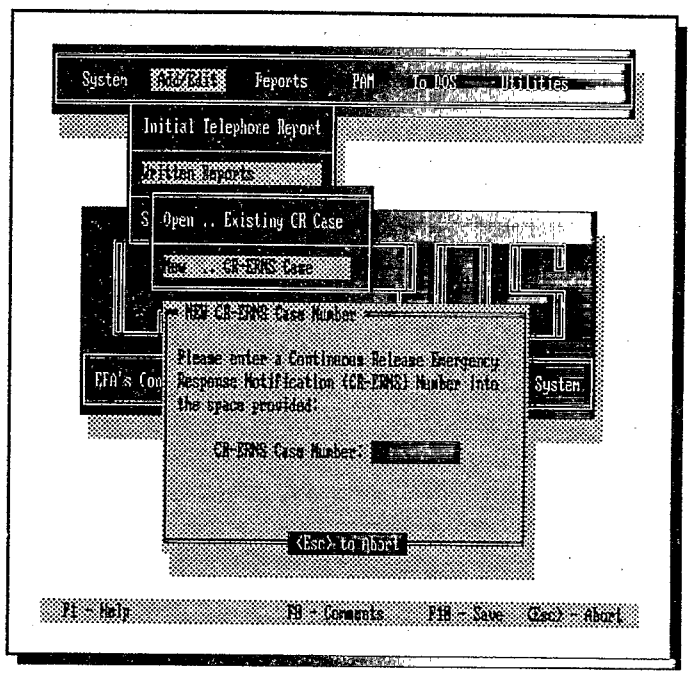
3. ENTERING CONTINUOUS RELEASE WRITTEN NOTIFICATIONS MANUALLY

Persons in charge of facilities or vessels have the option of preparing their written reports electronically and submitting a printed copy of the report and the diskette to the EPA Region or preparing their reports by hand. Accordingly, CR-ERNS has been designed to allow information contained in the continuous release written reports to be either uploaded from a computer diskette or to be entered manually. The purpose of this chapter is to describe how to manually enter information from written continuous release reports into CR-ERNS. This chapter is divided into four sections. Section 3.1 addresses how to manually enter information from a written initial notification. Section 3.2 provides instructions on how to enter information from a follow-up report. Section 3.3 provides instructions on entering change notifications. The final section, Section 3.4, discusses how to edit existing information.

3.1 Entering Initial Written Notifications

The first step in manually entering a new initial written notification is to select the "**Add/Edit**" option from the Main Menu of CR-ERNS. Next, select the "**Written Reports**" option from the Add/Edit menu by pressing the **<Enter>** key. CR-ERNS will provide the user with two options: either to enter a new CR-ERNS case number or to open an existing case number. Because this is a new initial written report, the user must select the "**New .. CR-ERNS Case**" option from the Written Reports menu by highlighting the option and pressing the **<Enter>** key. CR-ERNS will now prompt you to enter the new CR-ERNS case number (see Exhibit 3.1) provided by the facility or vessel in the written initial report. (If a CR-ERNS case number is not provided in the report, please refer to Section 3.1.1.) Once the user enters the CR-ERNS case number, CR-ERNS will ask the user to verify the entry. At this point, check the CR-ERNS number displayed on the screen to ensure that it matches the number provided in the initial written report. If it matches, type **<Y>**es; if it does not match, type **<N>**o. Once you type **<N>**o, you will be placed at the "**Written Reports**" option in the Add/Edit menu. Follow the directions above on how to proceed from this screen to enter the CR-ERNS case number.

Exhibit 3.1
Entering the CR-ERNS Number



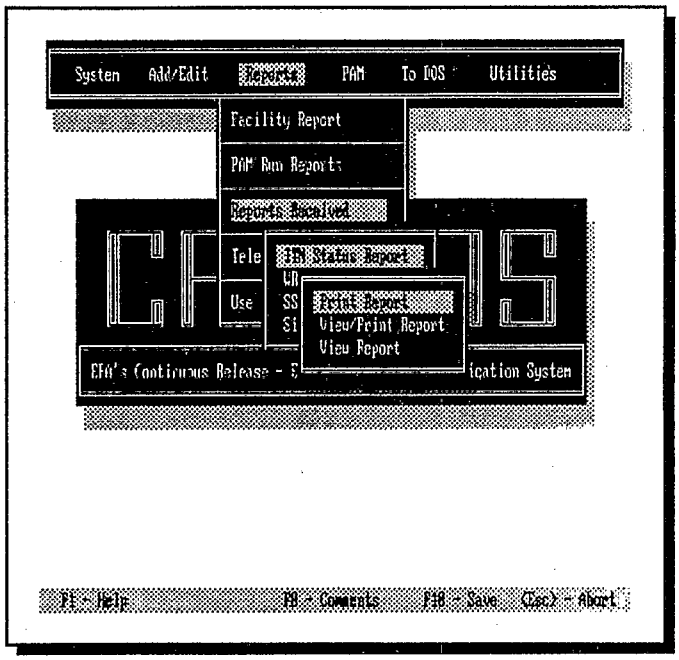
Upon entering a valid CR-ERNS case number and typing **<Y>**es at the appropriate prompt, the system will automatically place the user in the *Facility Information* screen. From this screen, you can now enter general information on the facility or vessel. Refer to Section 3.1.2 for specific instructions on how to complete this screen.

3.1.1 How to Locate a Lost CR-ERNS Case Number

In order to enter information from continuous release written reports, the user must provide the correct CR-ERNS case number for the facility or vessel. The system will not allow the user to proceed until a valid CR-ERNS case number has been entered. If a facility or vessel submits a written report without its CR-ERNS case number, EPA Regional personnel should contact the person in charge of the facility or vessel to obtain this number. If the person in charge has already made an initial telephone notification to the NRC but cannot locate their CR-ERNS number, the CR-ERNS system can be used to locate the CR-ERNS case number assigned by the NRC in the initial telephone call. If the person in charge never made an initial telephone call to the NRC, EPA Regional personnel should instruct the person in charge to make the initial telephone call to the NRC to obtain a CR-ERNS case number for the facility or vessel.

To locate a lost case number using CR-ERNS, select the "**Reports**" option from the CR-ERNS Main Menu, and then select the "**Reports Received**" option by pressing the **<Enter>** key. Next, select the "**ITN Status Report**" option by highlighting the option and pressing the **<Enter>** key. At this point, you must determine whether you would like to view, view and print, or just print the status report of all facilities and vessels in your Region that have made initial telephone notifications (see Exhibit 3.2). Move the cursor to the option that you select (e.g., to view the report) and press the **<Enter>** key.

Exhibit 3.2
Locating Lost CR-ERNS Numbers

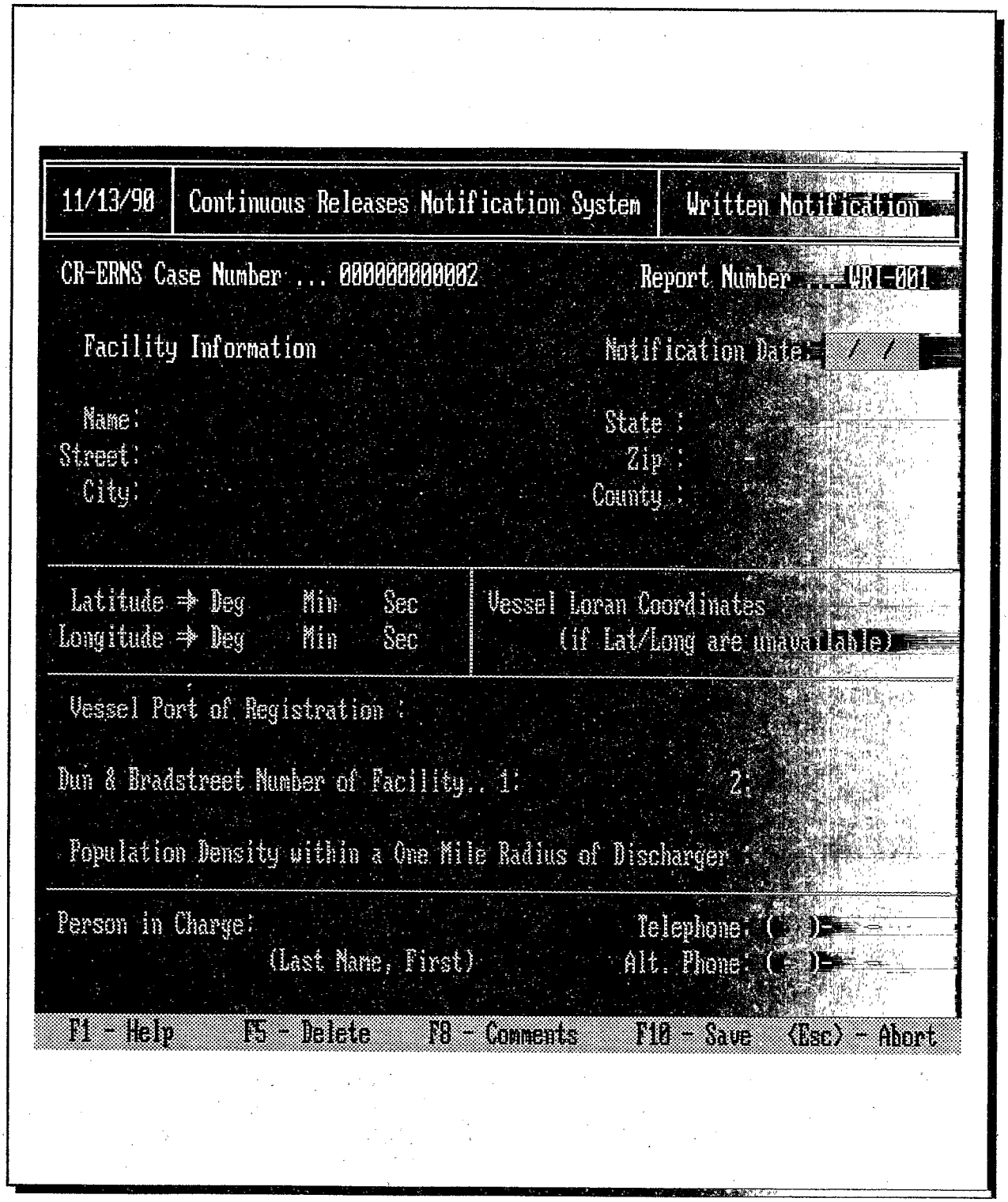


The ITN Status Report provides a listing of all facilities and vessels in your Regional database who have made an initial telephone notification to the NRC as required under the continuous release reporting regulations. (Note: The status report will not contain records of all the facilities and vessels that have notified the NRC. It will only contain the records that have been transmitted to your Region via the TSC.) Using the ITN status report, find the name of the facility or vessel that matches the name on the initial written report; the status report will indicate the CR-ERNS number for that facility or vessel.

3.1.2 Entering General Facility Information

The *Facility Information* screen (shown in Exhibit 3.3) allows the user to enter the general facility or vessel information provided in the initial written notification. The user should manually input the relevant facility or vessel information into the appropriate fields on this screen. The information required under the continuous release reporting regulation that must be included in the written initial notification and entered into CR-ERNS is briefly summarized below. Note that if any of the information specified below is omitted from the report, EPA Regional personnel should contact the person in charge of the facility or vessel.

Exhibit 3.3
General Facility Specific Information



Once all of the information requested on the *Facility Information* screen is entered, compare the responses on the screen with the information provided in the initial written report to be certain that the information has been entered correctly. If the information entered is correct, press the **<F10>** key to save the information.

Information to be Entered into CR-ERNS

Notification Date: Enter the date on which the report was completed.

Facility Information: Enter the name of the facility, along with its street address, city, county, state, and ZIP Code.

Latitude and Longitude: Enter the latitude and longitude of the facility in degrees, minutes, and seconds. If the continuous release is from a vessel, this entry should be left blank and the location of the vessel should be provided in terms of Loran Coordinates. If the written report contains latitude and longitude data that do not correspond to the county and state where the facility is located, an error message will appear on the screen indicating the range that would be appropriate for the applicable county or state.

Vessel Loran Coordinates: Enter the Loran Coordinates provided in the written report. These coordinates should denote the location where the release occurred.

Vessel Port of Registration: Enter the port name and state in which the vessel, if appropriate.

Dun & Bradstreet Number(s) of Facility: Enter the Dun & Bradstreet Number(s).

Population Density within a One-Mile Radius of Facility: Enter the estimate of the population per square mile within a one-mile radius of the facility.

Person in Charge: Enter the name, phone number, and alternate phone number of the person in charge of the facility or vessel.

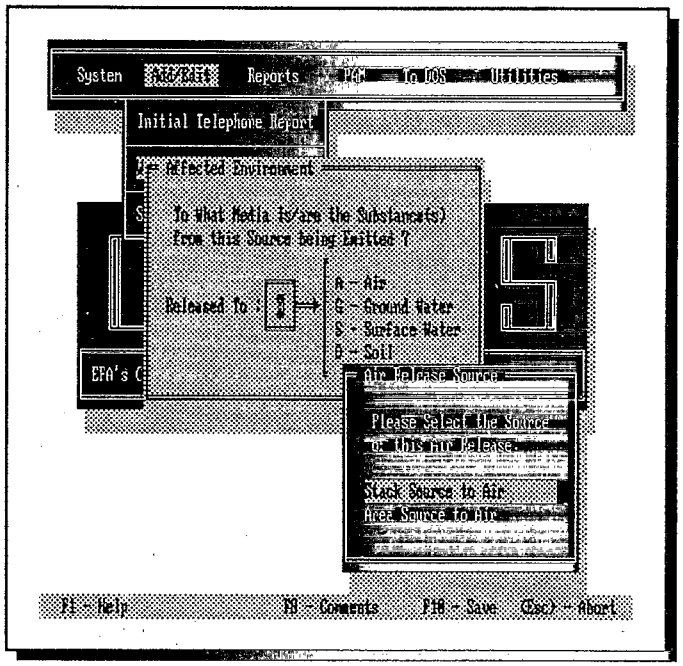
Sensitive Populations and Ecosystems within a One-Mile Radius of the Facility: To enter information on sensitive populations and ecosystems, press the **<F10>** key to save the general information. CR-ERNS will prompt you to verify the accuracy of the general information entered. If the information is correct, type **<Y>**es; if the information is not correct, type **<N>**o and reenter the information appropriately. Once all of the information is correct and the user has typed **<Y>**es at the appropriate prompt, the computer will automatically place you in the *Affected Environment* screen. At this point, you should enter the information on the sensitive populations and ecosystems, as provided in the written report. To enter this information, press the **<F8>** key to activate the comments field. The user can now enter information on sensitive populations and ecosystems by typing as with a word processor. To save this comment field, press the **<Ctrl><W>** keys. Note: In order for this comment field to be saved, you must proceed with the next step in the process of entering information into CR-ERNS which is to enter information on the sources of the hazardous substance releases from the facility or vessel. (Instructions on how to enter source information are provided in Section 3.1.3.)

3.1.3 General Information on Entering Source Data

After entering the general information on the facility or vessel, data on the source(s) of the continuous release must be entered into the system. This step must follow completion of the *Facility Information* screen (procedures for completing this screen are described above). The following information must be entered for each source of the hazardous substance release reported: (1) information describing the environmental medium affected by the hazardous substance (i.e., air, surface water, soil, and ground water), as shown in Exhibit 3.4; (2) information describing the type of source from which the hazardous substance(s) is released (e.g., smoke stacks, waste piles, or pipe vents); and (3) hazardous substance release information (refer to Section 3.1.8 for information on entering substance information).

As noted above, upon exiting the *Facility Information* screen, the computer will automatically place you at the *Affected Environment* screen (shown in Exhibit 3.4). CR-ERNS provides four choices for environmental medium affected: air, ground water, surface water, and soil. The system constrains the user to select only one medium for each source. Note, however, that if the source is an air release, the type of air release must be specified (see Exhibit 3.4).

Exhibit 3.4
Affected Medium



Procedures for entering the data specific to each environmental medium are presented in the following sections along with graphic illustrations of the corresponding input screens. These screens may be exited at any time without saving data by pressing the **<ESC>** key. The information may be saved by pressing the **<F10>** key. In either case the user must verify the action.

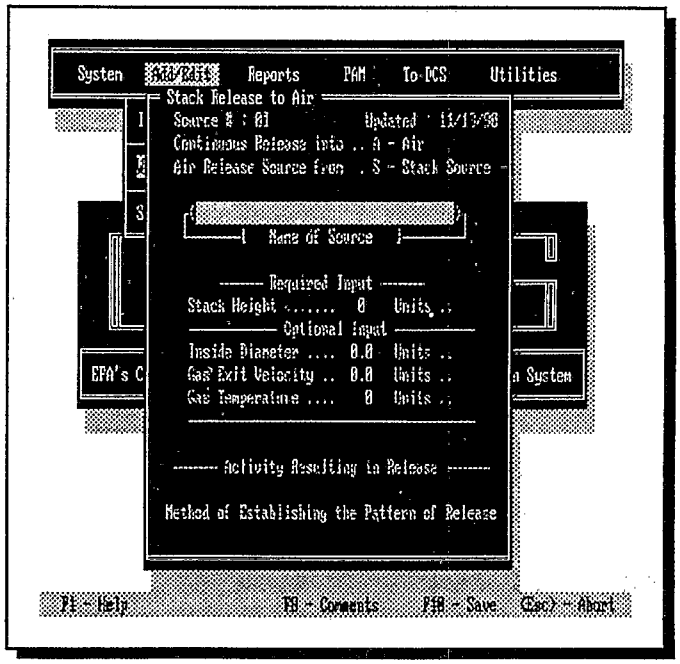
3.1.4 Releases to Air

To enter information into CR-ERNS on releases of hazardous substances to air, type **<A>**ir at the *Affected Environment* screen and then press the **<Enter>** key. At this point, CR-ERNS will prompt you to select the type of release to air. CR-ERNS tracks releases to air from two basic kinds of sources: stack sources and area sources. If the user selects the "**Stack Source to Air**" option, CR-ERNS will display the screen shown in Exhibit 3.5. If the user selects the "**Area Source to Air**" option, CR-ERNS will display the screen shown in Exhibit 3.6. The specific information required on each of these screens is specified below.

The information required on the *Stack Release to Air* screen includes:

Source Name: Enter the name of the source from which the release occurs.

Exhibit 3.5
Stack Release Source Information



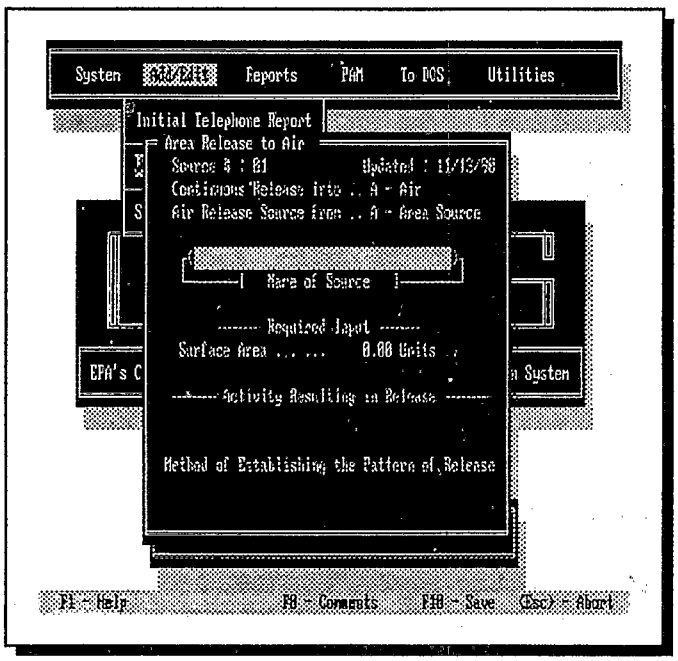
Stack Height: Provide the height of the stack from which the release occurs.

Activity Resulting in Release: Enter information describing the activity that causes the release. For example, production process for material X should be indicated as such. If the release is caused by a malfunction, press the **<F8>** key to enter the justification provided for claiming the release is continuous. Press the **<Ctrl>-<W>** keys when finished to save and exit.

Method of Establishing Pattern of Release: Enter the method used to determine that the release is continuous and stable in quantity and rate. Methods include, but are not limited to, best professional judgment, knowledge of the process, and past release data.

Optional Inputs: If the written report does not include the optional information (e.g., inside diameter of the stack, gas exit velocity, and gas temperature), leave these items blank. PAM has conservative default values built into the system.

Exhibit 3.6
Area Release Source Information



The information required on the *Area Release to Air* screen includes:

Source Name: Enter the name of the source from which the release occurs.

Surface Area: Enter the total surface area of the release source.

Activity Resulting in Release: Enter the description of the specific activity that causes the release. If the release is caused by a malfunction, press the **<F8>** key to enter the justification provided for claiming the release is continuous. Press the **<Ctrl>-<W>** keys when finished to save and exit.

Method of Establishing Pattern of Release: Enter information on the method used to determine that the release is continuous and stable in quantity and rate.

Whichever screen is completed (i.e., stack release screen or the area release screen), the information specified above should be entered for the relevant screen. Once the information is entered and verified with the written report, press the **<F10>** key to save the information. Upon saving the information, the computer will automatically place you at the *Release Source Listing* screen. At this point, follow the directions specified in Section 3.1.8 on how to enter hazardous substance information from the identified source. After completing the substance information for this source, you can then continue to complete source and substance information for additional sources.

3.1.5 Releases to Ground Water

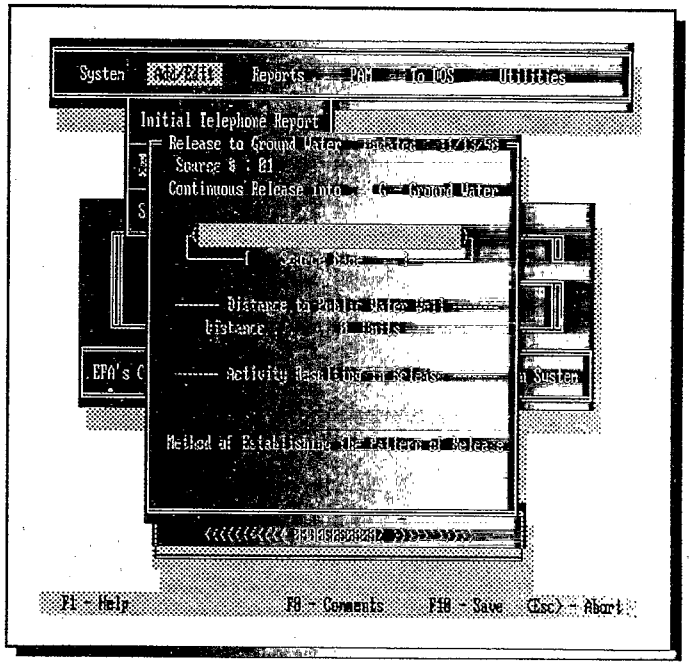
To enter information into CR-ERNS on releases of hazardous substances to ground water, the user must type **<G>** for the ground water option at the *Affected Environment* screen and then press the **<Enter>** key. After selecting this option, the computer will display the screen shown in Exhibit 3.7. The data elements presented on the *Release to Ground Water* screen are described briefly below.

Source Name: Enter the name of the source from which the release occurs.

Distance to Public Water Well: Enter the distance to the public water-supply well nearest to the source of the continuous release.

Activity Resulting in Release: Enter information on the specific activity that causes the release. For example, leaching from a stockpile of material X should be indicated. If the release is caused by a malfunction, press the **<F8>** key to enter the justification provided in the initial written report for claiming the release is continuous. Press the **<Ctrl>-<W>** keys when finished to save and exit.

Exhibit 3.7
Ground Water Release Source Information



Method of Establishing Pattern of Release: Enter the method used to determine that the release is continuous and stable in quantity and rate.

Once you have entered this source information, press the **<F10>** key to save the data. You should now proceed to input hazardous substance information pertaining to this source. (Instructions for completing hazardous substance information are presented in Section 3.1.8.) After completing the hazardous substance information for this source, you can then continue to complete source and substance information for additional sources.

3.1.6 Releases to Surface Water

To enter information into CR-ERNS on sources releasing to surface water, type **<S>**urface water at the *Affected Environment* screen and then press the **<Enter>** key. After selecting this option, the computer will display the screen shown in Exhibit 3.8.

To report a release of a hazardous substance to surface water, indicate whether the hazardous substances are released to a stream/river or a lake. You must enter one or the other of these two types of surface water bodies, but you cannot specify a release to both. The data elements presented on the *Release to Surface Water* screen are described briefly below.

Source Name: Enter the name of the source from which the release occurs.

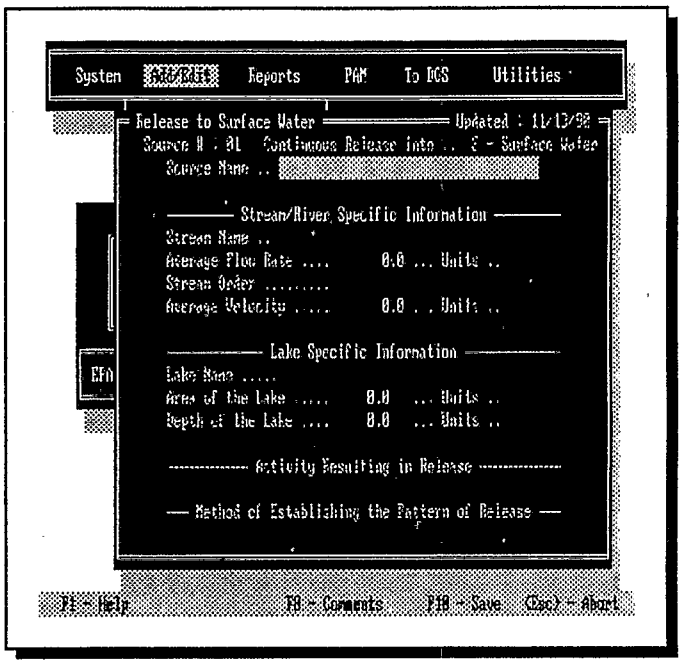
Stream/River Specific Information: Enter the name of the stream or river, and either the stream/river volumetric flow rate or the stream/river order. The stream/river velocity is optional information. This information, therefore, may not be provided.

Lake Specifics: Enter the name, surface area, and depth of the lake.

Activity Resulting in Release: Enter information on the specific activity that causes the release. For example, stormwater runoff should be indicated as such. If the release is caused by a malfunction, press the **<F8>** key to enter the justification provided in the initial written report for claiming the release is continuous. Press the **<Ctrl>-<W>** keys when finished to save and exit.

Method of Establishing Pattern of Release: Enter the method used to determine that the release is continuous and stable in quantity and rate. Methods include, but are not limited to, best professional judgment, knowledge of the process, and past release data.

Exhibit 3.8
Surface Water Release Source Information



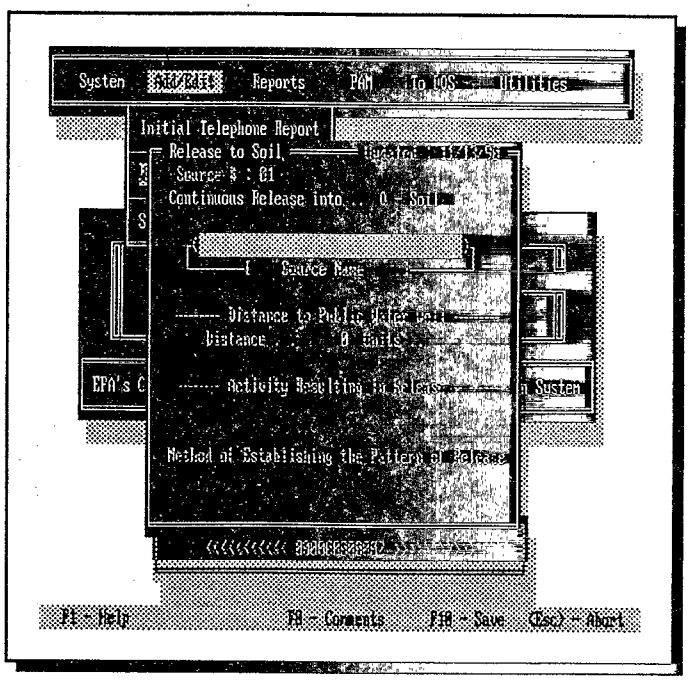
Once you have filled in the source information, press the **<F10>** key to save the data. You should now proceed to input hazardous substance information pertaining to this source. (Instructions for completing substance information are presented in Section 3.1.8.) After completing the hazardous substance information for this source, you can then continue to complete source and substance information for additional sources.

3.1.7 Releases to Soil

To enter information into CR-ERNS on sources releasing to soil, you must type **<O>** for soil at the *Affected Environment* screen and then press the **<Enter>** key. After selecting this option, the computer will display the screen shown in Exhibit 3.9.

The data elements presented on the *Release to Soil* screen are identical to those pertaining to releases to ground water. See Section 3.1.5 for a description of these elements. Once you have entered the source information, press the **<F10>** key to save the data. You should now proceed to input hazardous substance information pertaining to this source. (Instructions for completing substance information are presented in Section 3.1.8.) After completing the hazardous substance information for this source, you can then continue to complete source and substance information for additional sources.

Exhibit 3.9
Soil Release Source Information

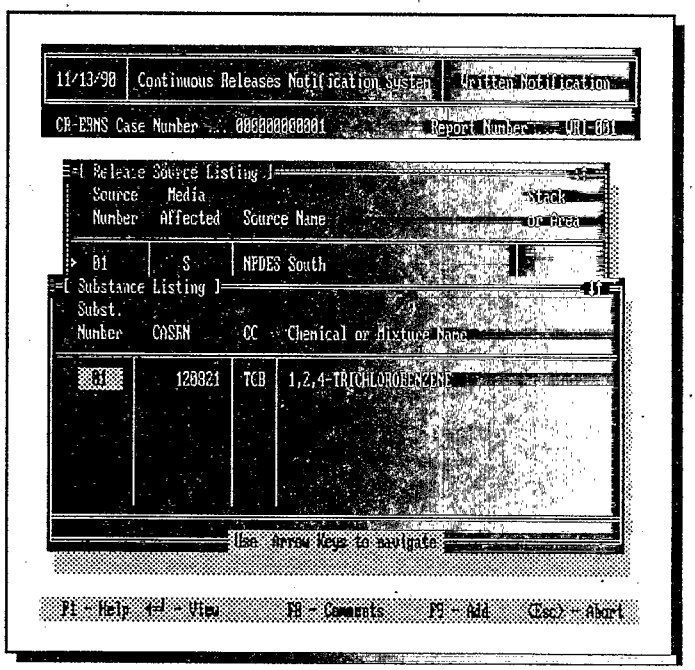


3.1.8 Entering Hazardous Substance Release Information

This section provides an explanation of how to input substance-specific information into CR-ERNS for an initial written notification. As noted above, once you have entered and saved all of the required source information for a given source, the computer will automatically place you at the *Release Source Listing* screen, shown in Exhibit 3.10 (this Exhibit also displays the *Substance Listing* screen described below). You should now proceed to input substance-specific information pertaining to this source. After completing the hazardous substance information for this source, continue to enter source and substance information for additional sources, as necessary.

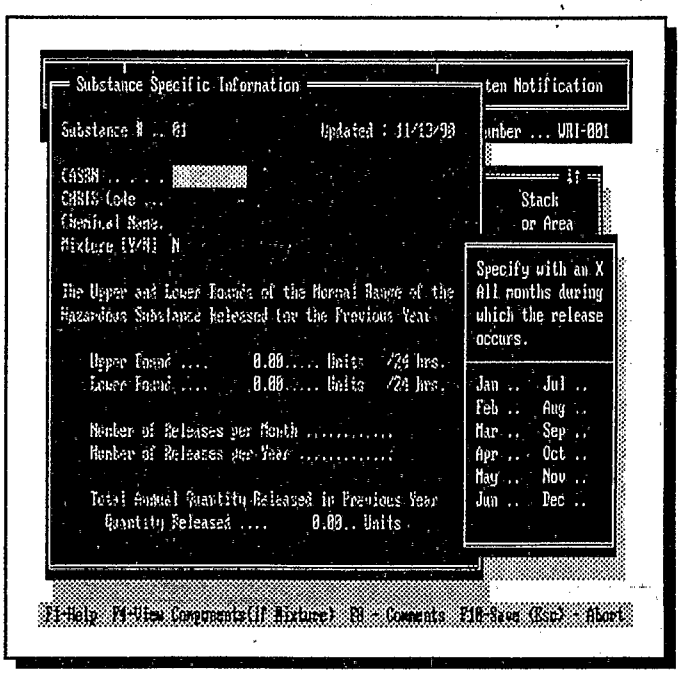
From the *Release Source Listing* screen (Exhibit 3.10), press the **<F4>** key to enter substance-specific information for the

Exhibit 3.10
Release Source and Substance Listing Screens



highlighted source. When you press the **<F4>** key, the *Substance-Specific Information* screen depicted in Exhibit 3.11 will appear.

Exhibit 3.11
Substance-Specific Information Screen



To enter information in the *Substance-Specific Information* screen, move the cursor to each field on the screen, type in the response provided in the initial written report, and press the **<Enter>** key. A brief description of the information requested on the *Substance-Specific Information* screen is provided below. After completing all of the information requested on the screen, press the **<F10>** key to save the information. The computer will ask you to verify the information entered, be certain to check the accuracy of the information on the screen with the submitted information.

Each of the data elements that must be completed in the *Substance-Specific Information* screen are described briefly below.

CASRN: Enter the CASRN for the hazardous substance. This number is a (maximum) ten digit number and should be entered without the usual dashes.

CHRIS Code: Enter the CHRIS Code for the hazardous substance, if provided. This is a three letter code that may not exist for every substance.

Chemical Name: Enter the name of the hazardous substance.

Mixture (Y/N): Indicate whether or not the release in question is a mixture of hazardous substances. If the release is a mixture, follow the instructions in Section 3.1.9 on how to enter information on the hazardous substance components of the mixture.

Upper and Lower Bounds of the Normal Range: In this field, enter the largest and smallest amounts of the hazardous substance or mixture that was released under normal operating conditions during a 24-hour period over the previous year.

Number of Releases per Month: Enter the average number of releases per month that occurred over the previous year.

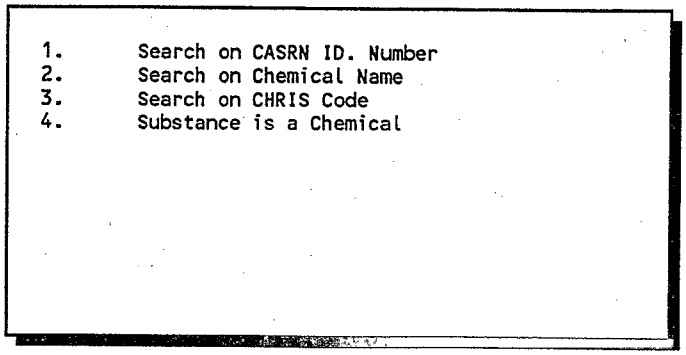
Number of Releases per Year: Enter the number of releases per year.

Total Annual Quantity Released in Previous Year: Enter the total amount of the identified hazardous substance or mixture released in the preceding year.

Months During Which the Release Occurs: Enter an **<X>** in the appropriate field to denote the months in which the release occurred. You must select at least one month.

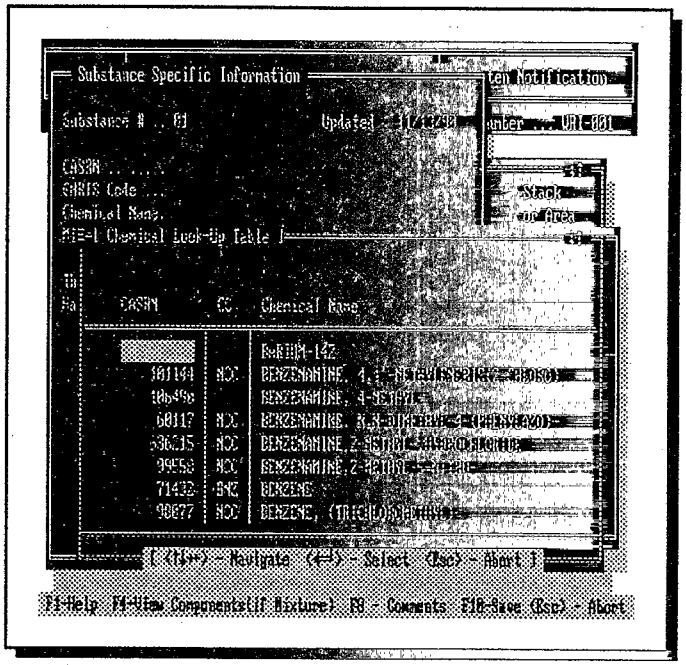
To assist the user in entering required chemical data requested on the *Substance-Specific Information* screen, CR-ERNS has a built-in chemical database of all the CERCLA hazardous substances subject to the continuous release reporting requirements. If the facility has submitted information on a chemical without a Chemical Abstract Service Registry Number (CASRN) or Chemical Hazards Response Information System (CHRIS) code, or has misspelled a chemical name or synonym, the system will automatically assist the user in entering valid information. A look-up screen will allow the user to search on CHRIS code, CAS number, or chemical name.

Exhibit 3.12
Chemical Look-Up Prompt



If you receive a report in which the hazardous substance is misspelled or a CAS number or CHRIS code is incorrect, leave the CAS number blank and press the **<Enter>** key. Select the search procedure you would like to use by highlighting that procedure and pressing the **<Enter>** key (refer to Exhibit 3.12). After entering the relevant number or name, the look-up table will display a list of hazardous substances, with the cursor on the one that most closely matches the name or number that you entered (refer to Exhibit 3.13).

Exhibit 3.13
Chemical Look-Up Table



Locate the appropriate chemical highlight it with the cursor, and press the **<Enter>** key. That chemical will be entered into the database. It is important for the model to have accurate name spellings and CAS numbers, so please verify the information submitted in the initial written report by using this look-up feature frequently.

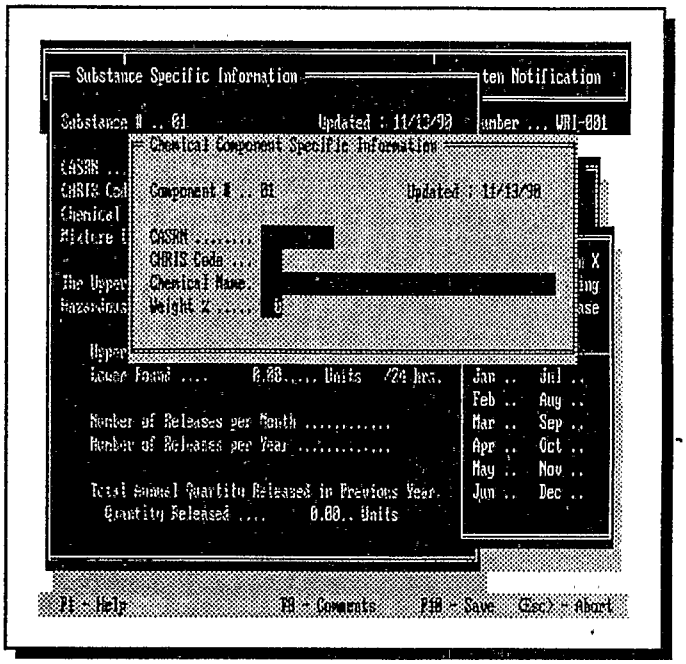
After you have finished entering the hazardous substance information in Exhibit 3.11, press the **<F10>** key to save the information. CR-ERNS will return you to the *Substance Listing* screen (shown in Exhibit 3.10), which will now display the chemical that you have reported for this source. If you need to report additional hazardous substances or mixtures, press the **<F9>** key; CR-ERNS will display the *Substance-Specific Information* screen again. Complete the information relevant to the additional hazardous substances released from the source. Once the information is entered and

verified, press the **<F10>** key to save the entry. Repeat this procedure until you have entered all of the hazardous substances and mixtures being released from the identified source.

3.1.9 How to Enter Mixtures

If the substance is a mixture, enter **<Y>**es in the appropriate field on the *Substance-Specific Information* screen (Exhibit 3.11). Next, enter all of the information requested on the *Substance-Specific Information* screen (e.g., upper bound and lower bound of the release, etc.). Once this screen has been completed, press the **<F4>** key to enter the hazardous substance components of the mixture. Pressing the **<F4>** key will display the *Chemical Component-Specific Information* screen (Exhibit 3.14). At this screen, enter the information for the first hazardous substance component of the mixture (be certain to indicate the weight percent of the hazardous substance component). If assistance is needed in entering the name of the hazardous substance component or the CAS number, refer to the chemical look-up table. Once the information on the first component is entered, press the **<F10>** key to save the information. Once the information is saved, the computer will place you back in the *Substance-Specific Information* screen. To add additional chemical components of the mixture, press the **<F9>** key and repeat the steps described above.

Exhibit 3.14
Chemical Component-Specific Information Screen



3.1.10 Final Steps in Entering Information

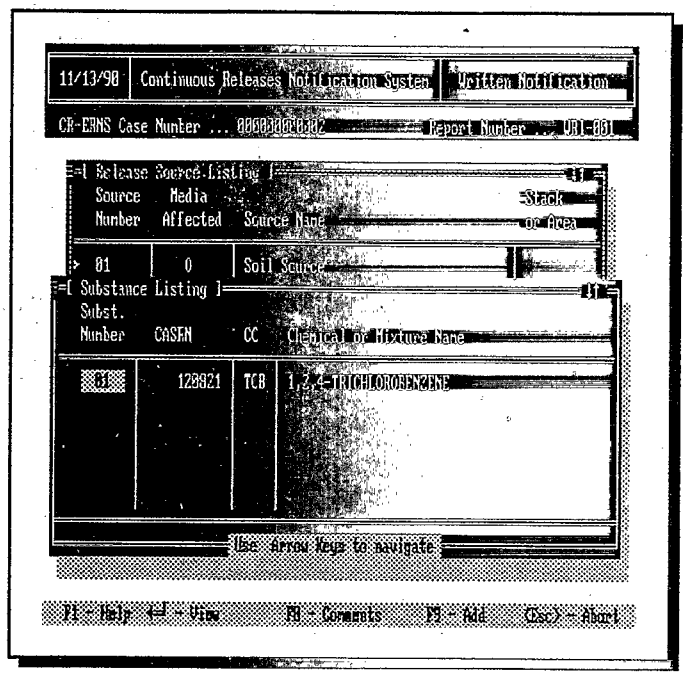
When information on the hazardous substance components of the mixture has been entered, the system will return to the *Substance-Specific Information* screen (Exhibit 3.11). Press the **<F10>** key to save the information on the mixture and to return to the *Substance Listing* Screen (Exhibit 3.10). This listing will display all substances and mixtures entered into the system. To add another substance, press **<F9>** and repeat the steps presented above. To view the hazardous substance or hazardous substance components, highlight the appropriate substance and press the **<Enter>** key.

When you have finished entering all of the substance information for the first source, press the **<ESC>** key to return to the *Release Source* screen (Exhibit 3.10). The user can enter a new source by pressing **<F9>**, or add hazardous substance information to sources already entered into the system by moving the cursor to the appropriate source and then pressing the **<F4>** key. The final step in the process is to print a copy of the initial written report to verify that the information in CR-ERNS is identical to the information provided in the initial written report submitted by the facility or vessel. Refer to Chapter 6 on how to generate a written initial report.

3.2 Entering Written Follow-up Reports

CR-ERNS allows the user to manually enter follow-up reports submitted by facilities or vessels. (The information provided in the follow-up report will be identical in format to the Initial Written Notification). To enter a written follow-up report, select the "**Add/Edit**" option from the Main Menu and then select the "**Written Report**" option from the Main Menu by highlighting it and then pressing the **<Enter>** key. Next, select the "**Open .. CR-ERNS Number**" option, supply the CR-ERNS case number of the facility or vessel that you want to enter, and choose the "**Follow-up Report**" option by pressing the **<Enter>** key (refer to Exhibit 3.15). The computer will prompt you to verify that you are inputting information from a written follow-up report. In addition, it will instruct you that the initial written report in the system will be archived. Type **<Y>**es at the appropriate prompt and the computer will automatically place you in the *Facility Information* screen. At this point, enter the new or revised general facility or vessel information. To enter this information, as well as any revised or new source and hazardous substance information, follow the instructions in Section 3.1. Be certain to press the **<F10>** key after completing each screen. Upon entering the required information, return to the Main Menu by pressing the **<ESC>** key. The final step in the process is to print a copy of the follow-up report to verify that the information in CR-ERNS is identical to the information provided in the follow-up report submitted by the facility. Refer to Chapter 6 on how to generate a written initial report.

Exhibit 3.15
Entering Follow-Up Reports and Change Notifications and Editing Existing Information



3.3 Entering Changes in Source or Composition Reports

CR-ERNS allows the user to enter a change in source or composition notification submitted by facilities. (The information submitted in these reports will be identical in format to the Initial Written Notification.) To enter a change in source or composition notification, select the "**Add/Edit**" option from the Main Menu and then select the "**Written Report**" option from the menu by highlighting it and then pressing the **<Enter>** key. Next, select the "**Open .. CR-ERNS Number**" option, supply the CR-ERNS case number of the facility or vessel that you want to enter, and choose the "**Changes in Source or Composition**" option by pressing the **<Enter>** key (refer to Exhibit 3.15). At this point, the computer will prompt you to verify that you are inputting information from a changed release report. In addition, it will instruct you that the previous report in the system will be archived. Type **<Y>**es at the appropriate prompt and the computer will prompt you to select either the "**General Facility Specific Data**" option or the "**Source & Composition Information**" option. If you select the "**General**

Facility Specific Data" option, the computer will place you in the *Facility Information* screen. If you select the **"Source & Composition Information"** option, the computer will place you in the *Release Source Listing* Screen. Whichever option is selected, you should enter the new or revised information by following the instructions in Section 3.1. Be certain to press the **<F10>** key after completing each screen.

Upon entering the required information, return to the Main Menu by pressing the **<ESC>** key. The user should note that persons in charge of facilities and vessels were instructed to indicate, using a highlighter or another appropriate method, which information in the report is new or changed. This should assist the user in entering change notifications. The final step in the process is to print a copy of the change notification to verify that the information in CR-ERNS is identical to the information provided in the change notification submitted by the facility. Refer to Chapter 6 on how to generate a written initial report.

3.4 How to Edit General Facility, Source, Substance, and Component Data

CR-ERNS allows the user to edit data when necessary. Because data integrity can be compromised when many users have the ability to edit information, this option should be used sparingly. CR-ERNS allows the user to edit general facility, source, substance, and component data. To edit such data, begin from the menu screen depicted in Exhibit 3.15. Once you select the **"Open .. Existing CR-ERNS"** option and provide the CR-ERNS case number of the facility or vessel to be edited, select the **"Edit Existing Information"** option. To enter new information, follow the instructions in Section 3.1.

4. LOADING CONTINUOUS RELEASE NOTIFICATIONS FROM INDUSTRY DISKS

As explained in the Introduction (Chapter 1), EPA has made available a reporting version of CR-ERNS that allows facilities and vessels to complete continuous release written notifications using their computer. Facilities and vessels that choose to report using the CR-ERNS industry version can comply with the continuous release reporting requirements by submitting both an electronic version of their report on a floppy diskette and a printed and signed copy of their report (which can be generated using the CR-ERNS industry system). This chapter explains how to upload the information submitted on the floppy diskette into your Regional CR-ERNS database for evaluation. In addition, this chapter provides an overview of the virus-protection features incorporated into CR-ERNS to ensure the integrity of your Regional computer system.

4.1 Virus Scan Features

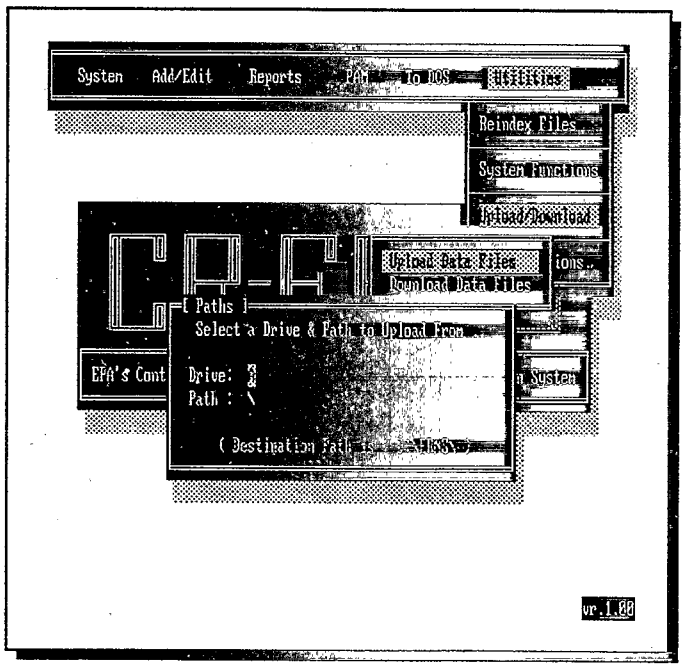
CR-ERNS incorporates a sophisticated memory-resident virus scanning program that searches all floppy disks uploaded into CR-ERNS for the presence of viruses. This program operates automatically when you access CR-ERNS and does not require the user to activate it. The presence of this virus scanning program will protect the integrity of your Regional CR-ERNS database from viruses that may be present on industry diskettes.

The virus scanning program will alert you when a disk you are uploading into CR-ERNS contains a virus. The program also contains a virus "disinfectant" that eliminates the virus found on the diskette. Complete documentation of how to use this virus scanner to eliminate viruses has been included in Appendix A.

4.2 Uploading Data Files

To upload a continuous release report to CR-ERNS, first place the floppy diskette in the "A:" drive (or other floppy disk drive on your computer) and close the disk door. From the Main menu, select the "**Utilities**" option and then the "**Upload/Download**" option; finally select the "**Upload Data Files**" option (Exhibit 4.1). Once you have selected the "**Upload Data Files**" option, CR-ERNS will display a box prompting you to verify the computer drive and path in which you have placed the floppy diskette. CR-ERNS assumes that you have placed the floppy diskette in the "**A:**" drive on your computer and that the files to upload are located in the root directory on this diskette (the root directory is designated as follows: "\"). If this is correct, press the **<Enter>** key twice to confirm these drives and paths.

Exhibit 4.1
Uploading Data Files into CR-ERNS



If your computer does not use the "A:" drive for floppy disks, or if the facility has placed the upload files in a subdirectory on the diskette, enter the correct values in the box displayed on the screen.

Once you have specified the location of the floppy diskette properly, CR-ERNS will automatically load these files into the database. If the facility has submitted several initial written reports for several of its facilities (using distinct CR-ERNS numbers), it will load the data for each facility into the system. CR-ERNS will also upload change notifications or follow-up reports submitted by the facility.

When CR-ERNS has completed uploading the continuous release reports from the floppy diskette, it will display a message indicating that it is automatically reindexing the database files in your Regional system. Reindexing the data files in CR-ERNS may take a few minutes, depending upon the size and number of reports being uploaded into the system, but is necessary to ensure the integrity of the added reports. Do not exit the system until the reindexing has been completed.

Once CR-ERNS has finished indexing the data files, the screen will display a message indicating that the upload process is complete. You are now ready to view or print copies of these reports, or use PAM to evaluate the relative threats posed by the new facility submittals.

5. USING THE PRIORITY ASSESSMENT MODEL (PAM)

The Priority Assessment Model (PAM) is a multimedia screening level risk analysis model that evaluates threats to human health and aquatic ecosystems posed by continuous releases. The risk assessment methodologies employed in PAM are documented fully in "Continuous Release-Emergency Response Notification System and Priority Assessment Model: Model Documentation," U.S. Environmental Protection Agency, Emergency Response Division, OSWER Directive No. 9360.7-03, October 1990. The user should consult this Model Documentation for all questions concerning the interpretation of PAM results. This chapter focuses only on how to run PAM and how to access the reports it generates. Appendix B of this User's Manual provides printouts of the various error messages that may be encountered using PAM.

PAM uses release information supplied by the facility or vessel in its written report, and other regional environmental parameters stored in permanent CR-ERNS databases, to evaluate the threats to human health and aquatic ecosystems posed by a continuous release. PAM generates two types of output:

- **PAM Summary Facility Evaluation Report:** The summary report provides aggregate facility level results allowing for a quick overview of the results; and

- **PAM Detailed Evaluation Report:** The detailed report provides chemical by chemical, source by source results for each environmental medium affected by the continuous release(s) evaluated in any given PAM run.

PAM also generates a model inputs file, that can be viewed before and after running the model, and a PAM message file. The model inputs file displays all of the physical, chemical, and locational parameters used to simulate the setting of releases at the facility. The PAM message file elaborates on any errors that may have occurred during the analysis (Appendix B provides an explanation of each of these error messages).

PAM also includes an option that allows each Region to tailor the way in which PAM assigns priority flags to each continuous release. This option also allows each Region to modify the default exposure distances used by the model for evaluating risks. This chapter explains how to edit these exposure and risk assumptions. Before making changes to the default values currently in CR-ERNS, you should carefully read the Model Documentation to thoroughly understand the impacts of your changes.

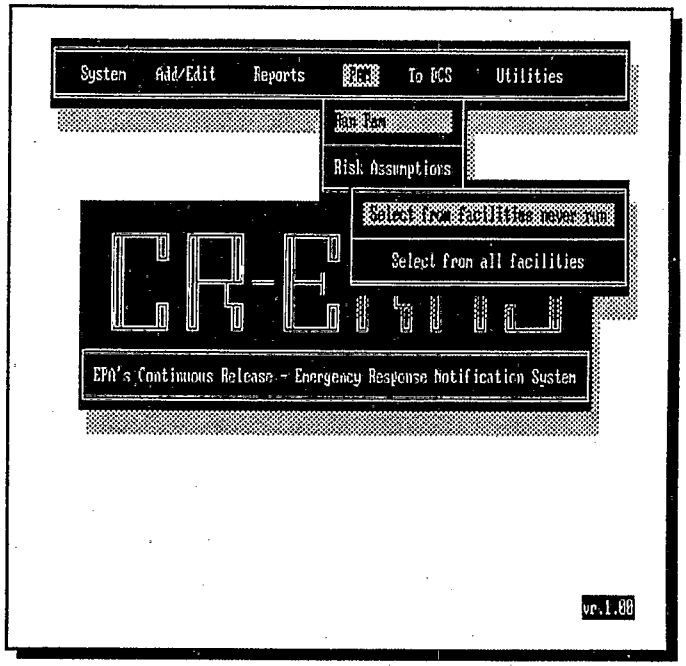
5.1 Running PAM

To begin a session with PAM, select the "**PAM**" option from the Main Menu. The system will display the primary PAM menu, which provides two options for the user: to run PAM or to modify the PAM risk assumptions. To run PAM at this point, select the "**Run PAM**" option (see Exhibit 5.1).

PAM provides the user with two options for selecting specific facilities to evaluate: (1) select from a list of all the facilities present in your CR-ERNS database; or (2) select from a list displaying only those facilities that have not yet been evaluated with PAM (these options are also illustrated in Exhibit 5.1). CR-ERNS provides this choice to prevent you from evaluating facilities more than once, unless you specifically choose to reevaluate a facility. Generally, the most appropriate option will be to

select from the list of facilities that have not yet been evaluated with PAM. When you want to reevaluate a facility, however, select the **"Select from all Facilities"** option.

Exhibit 5.1
Beginning a PAM Evaluation



CR-ERNS will next display a Facility Selection menu (Exhibit 5.2). This menu displays both the facility name and its CR-ERNS case number. To pick a facility to run, move the cursor (or use the space bar) to highlight the desired facility, and then press the **<Enter>** key. The menu will display asterisks around the selected facility to denote that you have selected it for evaluation (shown in Exhibit 5.2). Repeat this selection process until you have selected all of the facilities you wish to evaluate.

Once you have completed selecting facilities to evaluate with PAM, press the **<ESC>** key. The system will prompt you to verify that you have selected all of the facilities you want to evaluate. If you have selected all of your facilities, press the **<F10>** key to run PAM. If you want to pick more facilities, press any other key and continue selecting facilities as described above.

Once you press the **<F10>** key, which directs PAM to begin its evaluation, CR-ERNS will display a message indicating that CR-ERNS is creating PAM input files, and next, that it is running PAM. When the model run has been completed, PAM will return your display to the Main Menu. You can now proceed to review or print the model results.

5.2 Changing the PAM Default Assumptions

CR-ERNS allows the user to modify the default exposure and risk assumptions used by PAM to categorize the facility as "red", "yellow", or "green". These assumptions directly affect PAM's evaluation of continuous releases; changing them between runs may make it difficult to compare PAM results conducted at different times. For this reason, only the CR-ERNS System Administrator should change these risk assumptions.

To change the PAM default assumptions, select the **"Risk Assumptions"** option from the PAM menu. CR-ERNS will display the PAM Risk Assumptions menu shown in Exhibit 5.3.

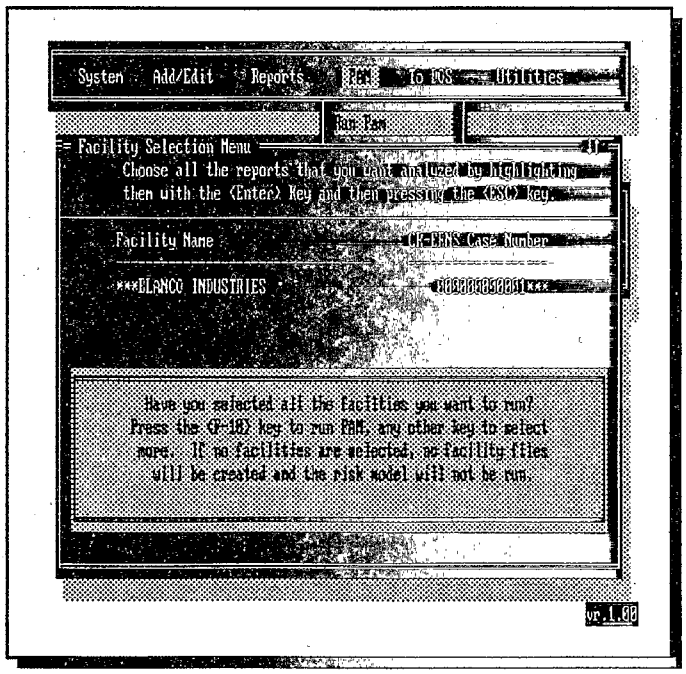
The default assumptions are divided into four categories:

- Air data;
- Surface water data;
- Ground-water data; and

Toxicological data.

The options for changing assumptions in each of these categories are discussed below. Once you have completed all changes to this entry screen, press the **<F10>** key to save the changes and return to the PAM menu.

Exhibit 5.2
PAM Facility Selection Menu

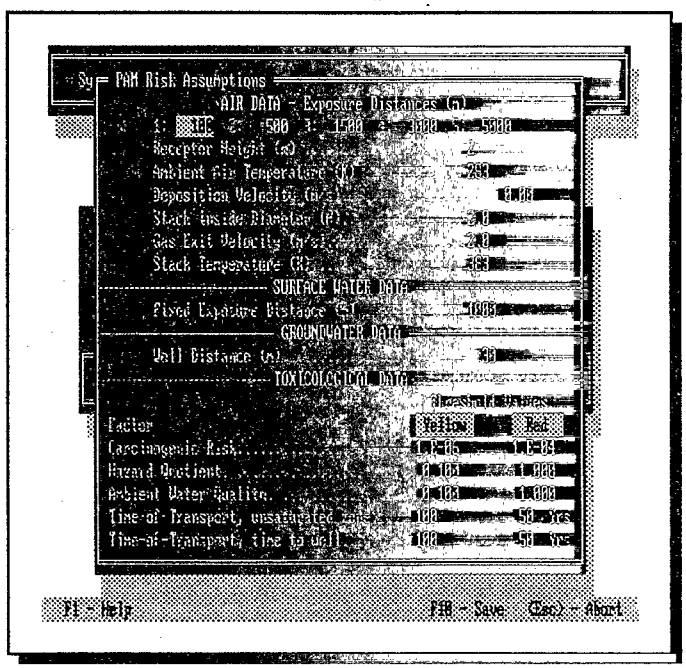


5.2.1 Air Data

CR-ERNS allows you to specify five default exposure distances at which PAM calculates ambient air concentrations. To change these values, which are designated in meters, move the cursor to the distance you would like to change and type in the revised distance; then press the **<Enter>** key.

CR-ERNS allows you to designate a receptor height (in meters), ambient air temperature (in degrees Kelvin), a deposition velocity for particulates (in meters per second), and three values for stack characteristics. To customize these values for your Region, simply move the cursor to the appropriate parameter, and press the **<Enter>** key.

Exhibit 5.3
Pam Risk Assumptions Menu



The stack characteristics information is used by PAM in situations where the facility does not include these optional reporting parameters in their continuous release report for stack releases. These parameters are the stack inside diameter (in meters), the stack gas exit velocity (in meters per second), and the stack temperature (in degrees Kelvin).

5.2.2 Surface Water Data

You can modify one default parameter for the surface water exposure route, the distance to the downstream exposure point. As explained in the Model Documentation, PAM calculates surface water concentrations both at the point of initial mixing and at a Region-specified exposure point. To change the Region-specified distance (in meters), move your cursor to the corresponding entry and type in the new value. Press the **<Enter>** key to record this entry.

5.2.3 Ground-Water Data

You can modify one default parameter for the ground-water exposure route, the distance to a hypothetical ground-water drinking well. As explained in the Model Documentation, PAM calculates ground-water times-of travel (TOT) to the water table directly below the source, and to the nearest public well specified by the facility in its continuous release report. PAM also calculates TOT to a Region-specified exposure point. To change the Region-specified distance (in meters), move your cursor to the corresponding entry and type in the new value. Press the **<Enter>** key to record this entry.

5.2.4 Toxicological Data

The Model Documentation provides a detailed explanation of the manner in which PAM categorizes facilities by assigning a red, yellow, or green flag. CR-ERNS allows each Region to customize the health effects values that define these flags. As shown in Exhibit 5.3, Regions may revise the carcinogenic risk thresholds, the hazard index thresholds, thresholds for aquatic effects in ambient water, and the thresholds for ground-water time of travel. To change these values, move your cursor to the selected entry and type in the new value; press the **<Enter>** key to record this entry.

5.3 Viewing or Printing PAM Facility Evaluation Reports with PAM Input Parameters

After running PAM, the user may want to examine the results of the facility evaluations. PAM generates two kinds of outputs, along with model inputs and message files for the user to examine:

- PAM Summary Evaluation Report;
- PAM Detailed Evaluation Report.

To examine these reports, select the "**Reports**" option from the Main Menu. The procedures for viewing or printing each of these reports is explained in Chapter 6, Generating Reports.

6. GENERATING REPORTS

CR-ERNS provides the user with options for viewing and printing a wide variety of facility reports, while also allowing the user to create customized reports using Relational Report Writer. The user can view or print copies of any of the facility or vessel notifications stored in CR-ERNS:

- Initial telephone notifications;
- Initial written notifications;
- Statistically significant increase (SSI) reports;
- Follow-up reports; and
- Changes notifications.

In addition to viewing or printing these notifications, the user can print a listing of all reports submitted to assist in tracking the status of continuous release activities in the Region. Finally, the user can view or print the inputs and results of PAM evaluations. The types of PAM reports available to the user include the following:

- PAM summary evaluation report;
- PAM detailed evaluation report;
- PAM input report; and
- PAM message file.

The procedures for accessing these CR-ERNS report generating features are discussed below for each type of report.

6.1 Viewing or Printing Written Reports

CR-ERNS allows you to view or print the most current written continuous release report submitted by the facility. This report may be the initial written report, a follow-up report, or a written report as amended by a change notification. CR-ERNS tracks one active written report for each CR-ERNS Case number. Thus, if a facility submits a follow-up report one year after the initial written report, this follow-up report becomes the current facility report. Copies of the original submittal are archived in CR-ERNS and can be accessed using dBase III software. This section explains how to view and/or print only the active facility report.

The first step in viewing or printing a copy of a written report is to select the "**Reports**" option from the Main Menu. Upon selecting this option, CR-ERNS will display the Reports menu (Exhibit 6.1). From this menu, select the "**Facility Report**" option. CR-ERNS will now display a look-up table of all written reports stored in the system files. You can scroll through this list using your cursor keys, or you can use the **<PgUp>** or **<PgDn>** keys, to find the facility whose report you would like to view or print. Once you have located the facility in the look-up list, highlight the facility by pressing the **<Enter>** key.

Once you have selected the facility whose report you would like to view and/or print, CR-ERNS will return you to the Reports menu and provide you with three options (also illustrated in Exhibit 6.1): printing, viewing and printing, or viewing the report. To select any of these options, move your cursor to the desired option and press the **<Enter>** key. If you are printing your report, indicate the number of copies you would like printed (up to 10 copies).

CR-ERNS will now print and/or display the facility report that you selected. If you are printing your report, it is critical that you specify the type of printer and the proper printer port used by your system. If you have not specified these properly, CR-ERNS will display an error message that your printer is not properly set-up. Once CR-ERNS has finished viewing and/or printing your report, you will be returned to the Reports menu.

6.2 Printing Initial Telephone Notifications and SSI Reports

CR-ERNS will allow you to print copies of initial telephone notifications (ITN) and SSI reports received by the National Response Center (NRC) as required under the continuous release reporting regulation. To print these reports, again select the Reports menu displayed in Exhibit 6.1. From this menu, select the **"Telephone/SSI Reports"** option from the Reports menu. CR-ERNS will now display the next menu choice, allowing you to print either an initial telephone notification or an SSI report (Exhibit 6.2).

Once you decide to print either an initial telephone notification or an SSI report, CR-ERNS will display a look-up table of all of the reports of the kind chosen stored in your system database files. As with all CR-ERNS look-up tables, you can scroll through the list using either your cursor or your **<PgUp>** or **<PgDn>** keys until you find the desired facility. Press the **<Enter>** key to select the facility to print. CR-ERNS will now prompt you to specify the number of copies you would like to print (up to 10). Once you have entered the number of copies to print, CR-ERNS will print your report.

Exhibit 6.1
CR-ERNS Reports Menu

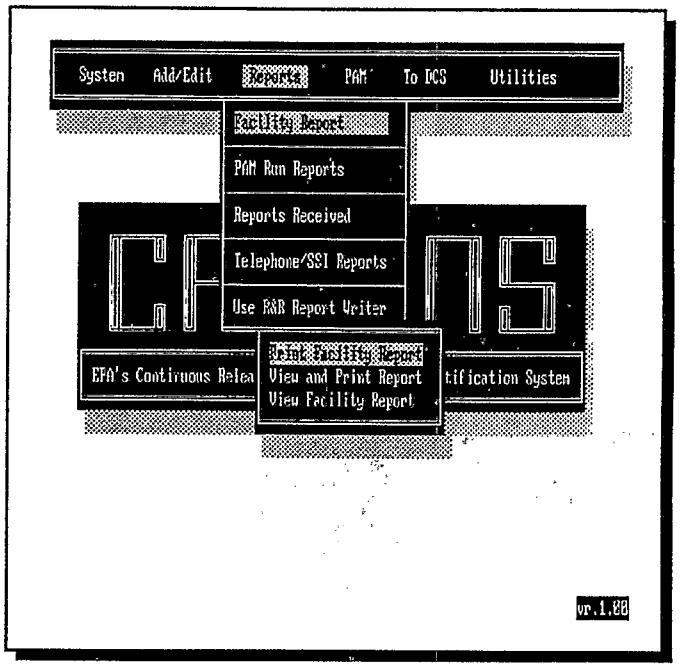
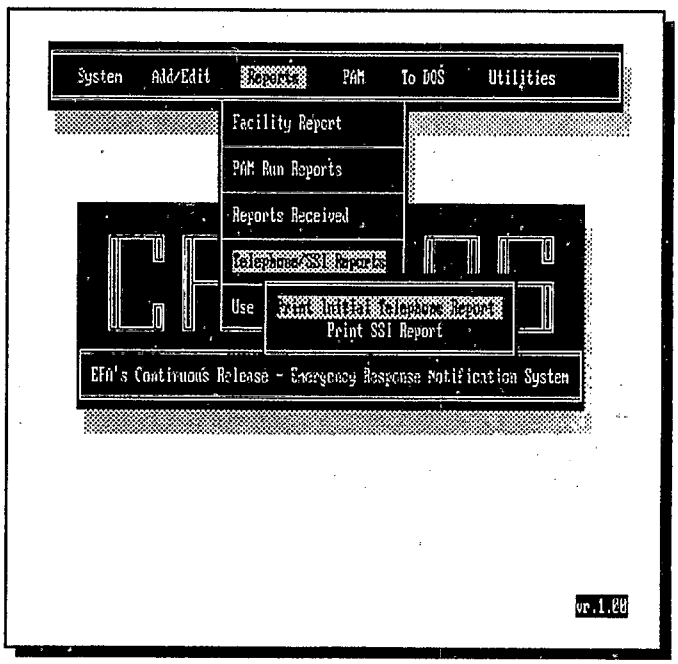


Exhibit 6.2
Printing Initial Telephone/SSI Reports

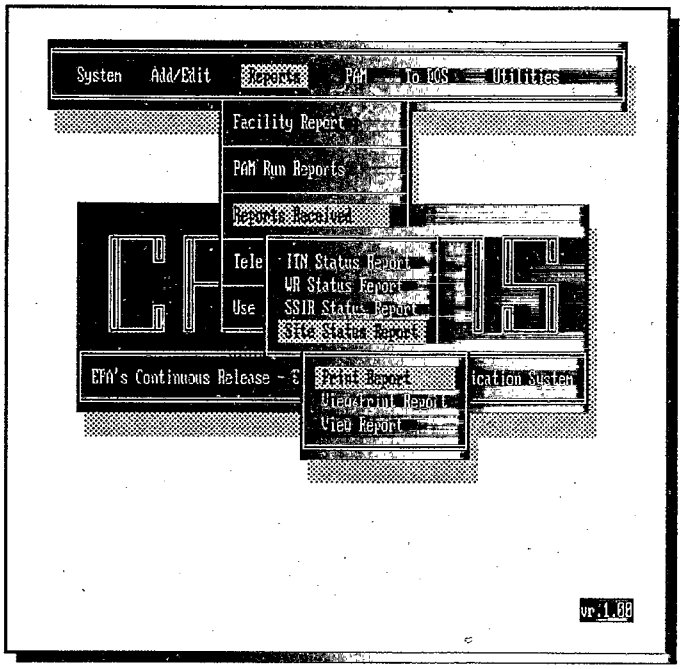


6.3 Generating Status Reports

CR-ERNS allows you to view and/or print status reports identifying the facilities that have submitted continuous release reports in your Region. It is also possible to generate reports identifying all of the reports submitted by a particular facility. These reports will assist you in tracking the status of facilities reporting under the continuous release reporting regulation. (As described in Section 6.5, CR-ERNS also provides access to Relational Report Writer, allowing you to customize status reports.)

In order to generate a facility status report, select the **"Reports"** option from the Main Menu, and then select the **"Reports Received"** option. CR-ERNS will now display the menu illustrated in Exhibit 6.3, providing the user with choices of viewing and/or printing the list of all initial telephone reports, SSI reports, or written reports received, or of generating a status report of all notifications submitted by a selected facility.

Exhibit 6.3
Generating CR-ERNS Status Reports



Select the kind of report you would like to generate from the following options:

- INT Status Report;
- WR Status Report;
- SSIR Status Report; and
- Site Status Report.

Once you have selected one of these options, CR-ERNS will display another menu option as shown in Exhibit 6.3. You will have the option of either printing, printing and viewing, or just viewing the status report. Once again, CR-ERNS will prompt you to specify the number of copies of the report you would like to print. You will be returned to the Reports menu once CR-ERNS has finished displaying or printing your report.

The Site Status Report may be of greatest use for many Regional personnel, as it can be used to determine quickly whether a facility has submitted its initial written report within 30 days of its initial telephone notification, or if it has submitted its follow-up report within 30 days of the first anniversary date of the initial written notification. Because the Site Status Report also displays all of a facility's SSI reports, this report can be useful in gaining an understanding of the overall level of releases taking place at the facility.

6.4 Viewing or Printing PAM Evaluation Reports

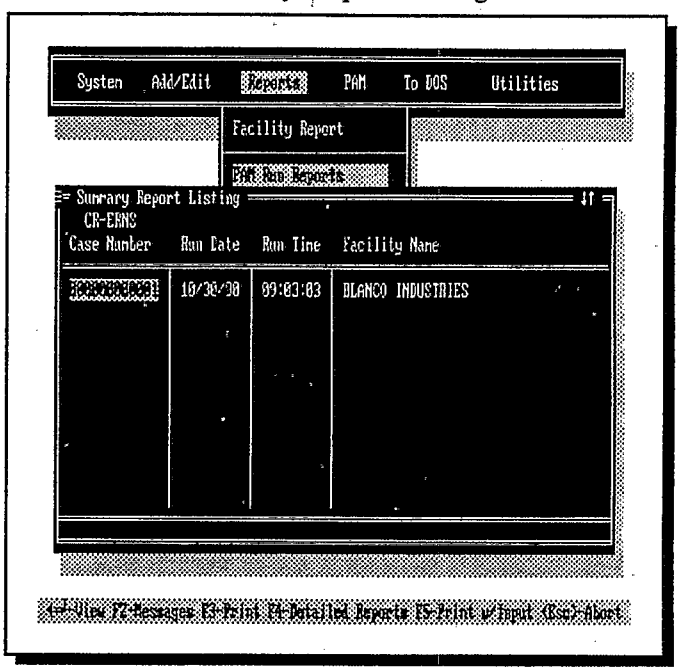
Once you have evaluated the continuous releases at a facility or a group of facilities using PAM, you can view and/or print copies of PAM evaluation reports. Each time a facility is evaluated using PAM, four reports are generated:

- PAM summary evaluation report;
- PAM detailed report;
- PAM input report; and
- PAM message report.

This section explains how to view and/or print each of these reports using CR-ERNS.

To generate PAM evaluation reports, first select the **"Reports"** option from the Main Menu, and then select the **"PAM Run Reports"** option. CR-ERNS will now display a Summary Report Listing screen identifying all of the facilities that have been evaluated using PAM (Exhibit 6.4). Select the facility you would like to examine using your cursor keys or the **<PgUp>** or **<PgDn>** keys.

Exhibit 6.4
PAM Summary Report Listing Screen



As shown in Exhibit 6.4, the Summary Report Listing screen displays five available options listed at the bottom of the screen for working with PAM reports. Each of these function keys will generate a different PAM report, as described below.

To view the PAM summary report, press the **<Enter>** key from the Summary Report Listing screen. CR-ERNS will display the PAM summary report on your computer monitor. (In order to understand the meaning of the information presented in the summary report, consult the CR-ERNS Model Documentation.) Press the **<ESC>** key to return to the Reports menu.

To print the PAM summary report, press the **<F3>** key. CR-ERNS will prompt you to specify the number of reports you wish to print (between 1 and 10). Once you have specified this number, CR-ERNS will print the PAM summary report. Be sure that you have specified your printer and printer port correctly, or CR-ERNS will not print the report.

PAM Message files contain four types of errors that tell the user what has gone wrong on any particular analysis. These include the following types of messages:

- **System Error:** an unrecoverable error, something wrong with the CR-ERNS/PAM system, see your System Administrator.

- **Error:** a recoverable error which stopped PAM from running a section of the facility. The user may only need to change a parameter to correct this problem.

- **Warning:** a note to examine carefully the PAM Detailed Evaluation Report due to a possible anomaly in the data.

- **Message:** notes the error which caused PAM to stop.

This file is provided to give the user a deeper insight into the workings of the model and allows the user to take into account some of the assumptions PAM may have made or problems PAM may have had in analyzing releases from a facility or vessel. To view the PAM error messages file, press the **<F2>** key from the Summary Report Listing screen. After you have selected this option, CR-ERNS will display the PAM error messages. It is not possible to print the PAM error message file from CR-ERNS, though many of the messages will be printed in the detailed report. For a library and explanation of the various PAM error messages, see Appendix A to this report.

To view or print the PAM detailed report, press the **<F4>** key from the PAM Summary Report Listing screen. CR-ERNS will display another menu with three options: print, view and print, or view the PAM detailed report. Once you select one of these options, CR-ERNs will print or display the detailed PAM report. For a full explanation of the PAM detailed report, consult the CR-ERNS Model Documentation.

Finally, CR-ERNS allows you to print the PAM detailed report along with the PAM input specifications. By printing the PAM input files, you can gain a greater understanding of the results of the PAM screening evaluation. To print the detailed report along with the inputs, press the **<F5>** key. CR-ERNS will prompt you to specify the number of reports you would like to print (between 1 and 10). After printing the reports, CR-ERNS will return you to the Reports menu.

6.5 Generating Reports with Relational Report Writer

CR-ERNS allows you to generate additional reports by providing a shell to Relational Report Writer (R&R), a database report writing software available in most EPA Regional offices. To access R&R, select the **"Use R&R Report Writer"** option from the Reports menu (see Exhibit 6.1). Selecting this option will activate this report writing software, provided that it is installed on your computer and that the default path has been specified correctly from the Utilities menu (this is a System Administrator function described in Chapter 7).

This User's Manual does not explain how to use R&R. For guidance on using this software to generate customized reports, consult your R&R documentation.

7. DATA COMMUNICATIONS

CR-ERNS incorporates an easy-to-use data communications function that allows Regions to communicate with the TSC. In particular, it supports the following data transfer activities:

- Initial telephone notifications and SSI reports received by the NRC, which are then transmitted to TSC, can be transmitted by TSC to the appropriate EPA Regional office; and

- Written reports received in each Region can be transmitted to the national CR-ERNS database located at the TSC.

The CR-ERNS data communications program both sends and receives reports simultaneously, thus minimizing the time that must be spent sending data between each Regional office and the TSC. Each Region is responsible for establishing procedures with TSC for conducting these data communications activities.

7.1 Overview of Data Transfer Program

The CR-ERNS data communications program compresses the continuous release reports being sent to TSC into an easily transferable file. To create these transferable files, CR-ERNS compresses the selected continuous release reports into a "zip" file. Next, CR-ERNS uses your computer's internal modem to dial TSC. Once contact has been made with TSC, the system will send the "zipped" file to TSC and also receive any data that has been prepared for transmission from TSC to the Region. Once the data transmission has been completed, CR-ERNS will disconnect the modem communication.

The telephone number for the TSC computer has been programmed into your Regional version of CR-ERNS. Thus, it is not necessary to enter any information such as telephone number, speed of the transmission, or parity of the transmission. All of the necessary information for communicating with TSC has been specified in the system. Before transmitting data to TSC, however, it is advisable to speak with TSC personnel to confirm that their computer is in the proper mode to receive your report.

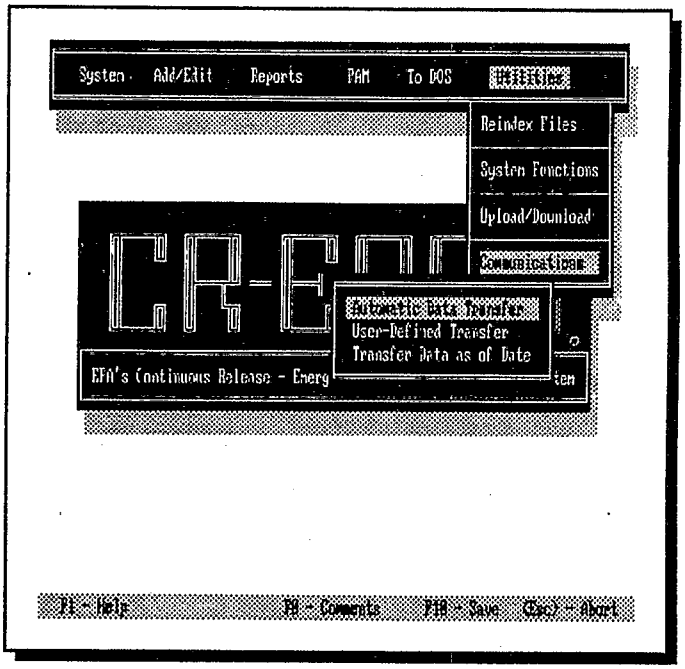
Data communications should be conducted by the CR-ERNS System Administrator or by other personnel under his/her direction. Because this operation is more complex than most of the CR-ERNS functions, it is important that only experienced users undertake this activity.

7.2 Transferring Data with TSC

To begin a communications session, select the **"Utilities"** option from the Main Menu, and then select the **"Communications"** option (Exhibit 7.1). CR-ERNS will display another menu providing three options for conducting data communications:

- Automatic Data Transfer;
- User-Defined Transfer; and
- Transfer Data as of Date.

Exhibit 7.1
Data Communications Menu and Options



The **"Automatic Data Transfer"** option compresses and sends to TSC all continuous release written reports that have not previously been transmitted to TSC. In most cases, this will be the easiest way to send reports, as CR-ERNS will automatically determine which reports have already been sent and then will only send reports that have been received since that date. With the **"User-Defined Transfer"** option, Regions can select individual facilities or groups of facilities to transmit to TSC. This will be useful when you do not want to send certain files that have not yet been entered completely into CR-ERNS. The **"Transfer Data as of Date"** option allows Regions to send all reports that have been received after a user-specified date, even if they have been sent previously.

To send all new reports to TSC, select the **"Automatic Data Transfer"** option from the Communications menu. Once you have selected this option, CR-ERNS will prompt you to verify that you want the communications program. Press **<Y>**es to confirm your intention to transmit data. CR-ERNS will now display a message that it is processing your files for transfer. Next, it will prompt you to confirm that you would like to start the transfer; enter **<Y>**es to continue.

From this point, CR-ERNS will automatically compress your data files and dial TSC using the internal modem. The display screen will keep you informed about each activity as it is taking place. If the communication with TSC is successful, CR-ERNS will transmit the prepared files. If the telephone is busy or if the connection is not completed, CR-ERNS will display that the contact was not made. You will then be returned to the Communications menu.

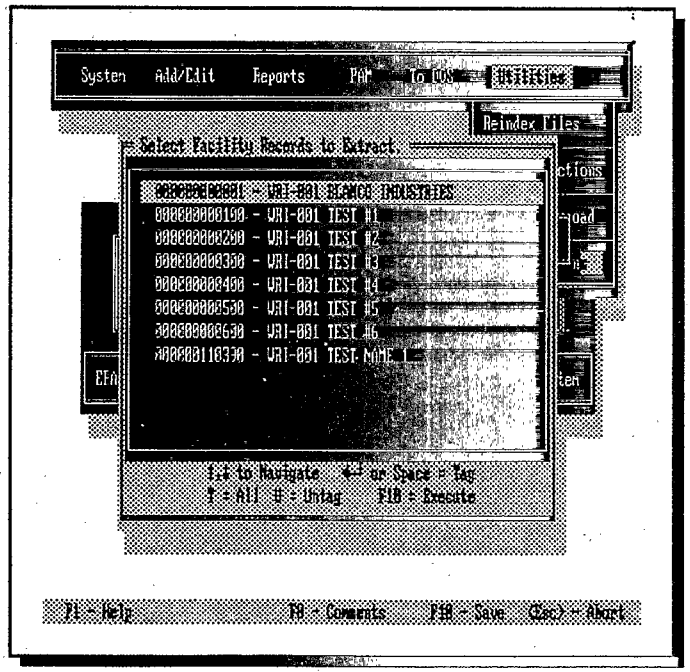
To send selected reports to TSC, select the **"User-Defined Transfer"** option from the Communications menu. The system will prompt you to verify that you want the communications program; press **<Y>**es to continue. CR-ERNS will then ask you if you want to start data transmission; press **<Y>**es to continue. Next, CR-ERNS will display a look-up table that allows you to select specific facilities to extract for transfer (Exhibit 7.2). Use either the **<Enter>** key or **<Space>** bar to pick specific facilities. If you wish to pick all of the facilities in the list, move your cursor to the top of the list and press the **<T>** key; if you want to untag the facilities from your cursor down the list, press the **<U>** key.

Once you have selected all of your facility reports to transmit, press the **<F10>** key to execute the communications. The system will now conduct the communications process as described above.

To send only those reports received after a specified date, select the **"Transfer Data as of Date"** option from the Communications menu. CR-ERNS will display a box prompting you to enter the date from which you want to transmit your reports. After you have entered this date, the system

will extract all files received on or after the specified date; CR-ERNS will also transmit any reports that have not yet been transmitted regardless of date at the same time.

Exhibit 7.2
Selecting Specific Facilities for Transfer



8. UTILITIES AND SYSTEM ADMINISTRATOR FUNCTIONS

This chapter explains how to use a variety of CR-ERNS utilities and functions. Many of these utilities are reserved for use by the System Administrator or designated staff. To minimize risk to the database, CR-ERNS uses a password system to restrict access to certain functions. Other utilities found in CR-ERNS, such as the memory-resident pop-up calculator, are appropriate for use by all staff. This chapter explains how to use the following functions:

- File reindexing;
- Printer selection;
- Backup and restore;
- Default drives and path setup;
- System password specifications;
- DOS vacation;
- Pop-up calculator; and
- CR-ERNS planning calendar.

8.1 Reindexing CR-ERNS Database Files (System Administrator)

CR-ERNS is a relational database management system programmed in Clipper, which allows the management of data in dBase-style files. To save and retrieve data properly, database management systems of this kind create and maintain database indices that point to the location of each data element. In order for the system to work properly and to protect the integrity of all data, these indices must be maintained properly.

CR-ERNS checks the system index files during operation and updates them whenever necessary. Thus, under normal operating circumstances, it should not be necessary to reindex these files. In some cases, however, such as during a power black-out, these index files may need to be reindexed for the system to continue proper operation. Sluggish operation or inoperative functions can be a symptom that the system should be reindexed.

If an error has occurred that could affect the indices, reindex all the CR-ERNS files immediately upon starting CR-ERNS again, before any other work is begun. If the reindexing is not done, all information entered into CR-ERNS will be unreliable.

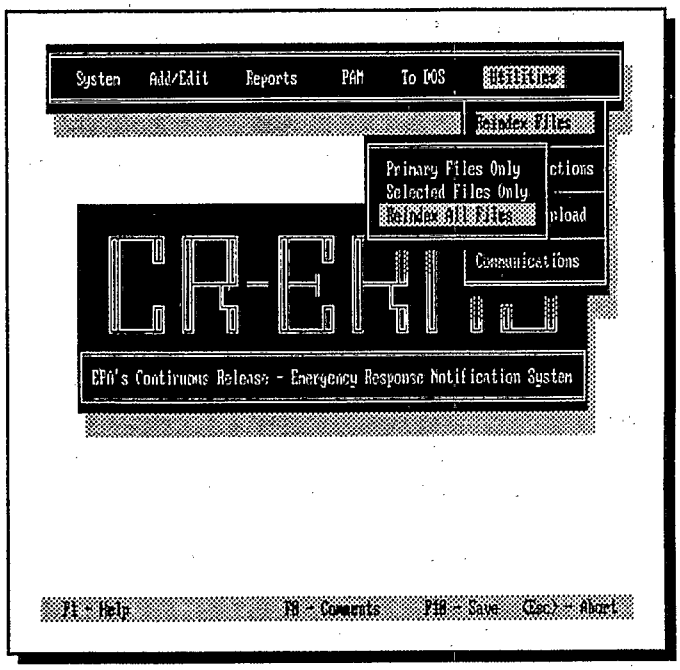
CR-ERNS provides the user with three options for reindexing files, each of which are explained below:

- Reindex all files;
- Reindex primary files; and
- Reindex selected files.

To reindex all CR-ERNS files, select the "**Utilities**" option from the Main Menu and then select the "**Reindex Files**" option. Next select the "**Reindex All Files**" option (Exhibit 8.1). CR-ERNS will begin reindexing all the files; the system displays a counter while reindexing each file to highlight the activity. Do not stop the computer while the system is reindexing. When CR-ERNS has finished reindexing, press the **<ESC>** key twice to return to the Main Menu.

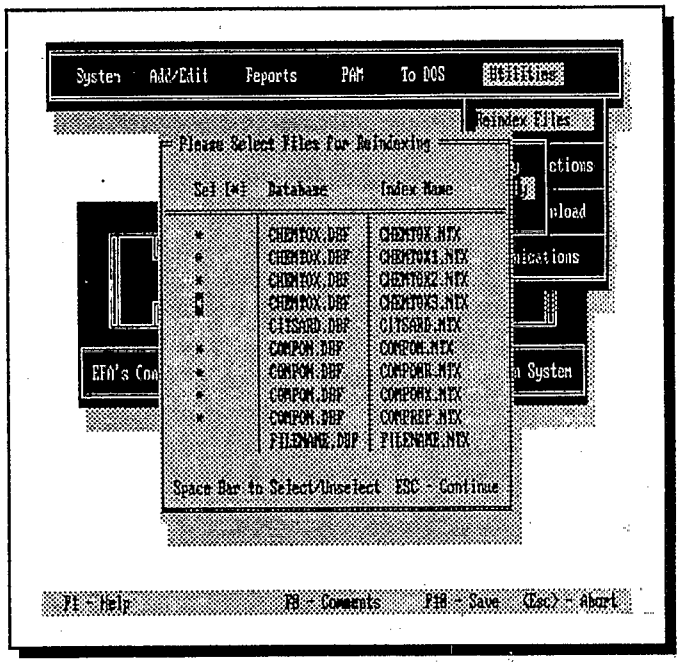
In some cases, it may not be necessary to reindex all database files, as it is apparent that only a given file may be in error. In such a case, it may only be necessary to index selected files. Selecting the "**Primary Files Only**" option will achieve essentially the same outcome as reindexing all files, although it is faster (large reference databases will not be reindexed). To use this option, select the "**Primary Files Only**" option from the Reindex Files menu. The system will automatically reindex the primary database files.

Exhibit 8.1
Reindexing CR-ERNS Database Files



The "**Selected Files Only**" option allows the user to select specific files to be reindexed. After selecting this menu option, select the files by highlighting them and then pressing the **<Space Bar>** key. This will place an asterisk (*) next to the selected files (shown in Exhibit 8.2). When the user has chosen all the files to be reindexed, press the **<ESC>** key. CR-ERNS will then reindex the chosen files. When CR-ERNS is finished reindexing, press the **<ESC>** key twice to return to the Main Menu.

Exhibit 8.2
Reindexing Selected Files



8.2 Printer Selection (System Administrator)

CR-ERNS can be setup to print on over 100 types of printer. An important System Administrator function involves specifying the correct printer for the Region.

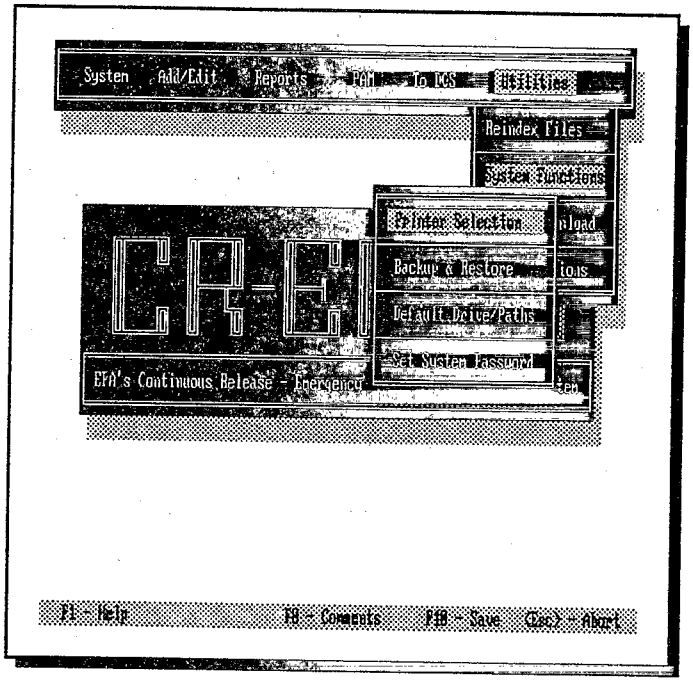
To specify a printer, select the "**Utilities**" option from the Main Menu and then select the "**System Functions**" option; finally, as shown in Exhibit 8.3, select the "**Printer Selection**" option. The printer currently installed is highlighted at the top of the displayed list of printers. To select a printer, scroll through the list of printers using your cursor or the **<PgUp>** or **<PgDn>** keys. When you have highlighted the proper printer, press the **<Enter>** key to select it.

After selecting a printer, the system will display the current printer port to which the printer is attached (e.g., LPT1 or LPT2). If this is

correct, press the **<Enter>** key. If it is incorrect, enter the proper printer port and press the **<Enter>** key.

CR-ERNS also allows you to specify a customized printer using Lotus style setup strings. For this feature, select the "**Other Printer**" option from the choices on the printer list. Next, change the printer port, if needed, by typing it in; the current default port is shown on the screen. The user will then be asked to enter Lotus style set up strings for the desired features. After you have entered the appropriate set-up strings, press the **<Enter>** key to save the new printer specifications.

Exhibit 8.3
Specifying a Printer

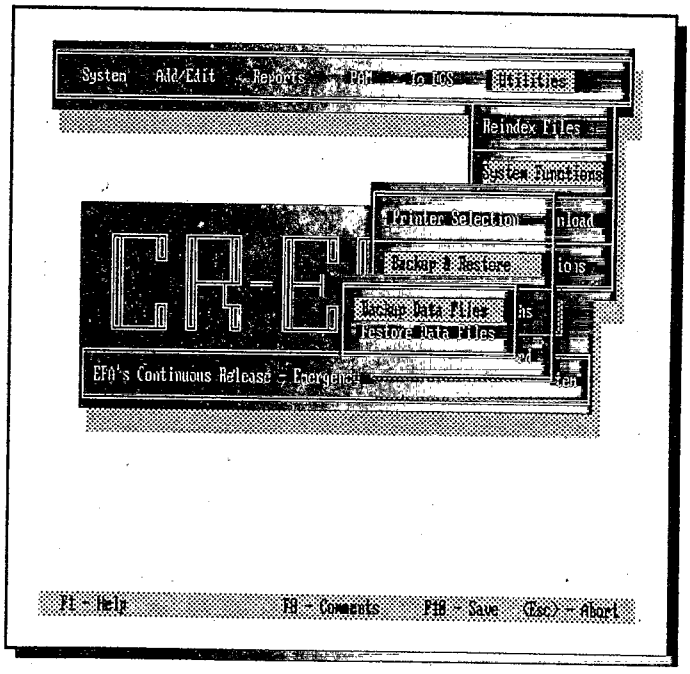


8.3 Backup and Restore (System Administrator)

Backing up CR-ERNS data should be performed on a daily basis to avoid data loss and to ensure data integrity. The recommended backup procedure is to have the same person back up CR-ERNS daily, using a five disk (or set of disks) rotation: one for each day of the week.

To backup CR-ERNS data, select the "**Utilities**" option from the Main Menu and then select the "**System Functions**" option; from this menu, select the "**Backup & Restore**" option, and finally, select the "**Backup Data Files**" option (see Exhibit 8.4).

Exhibit 8.4
Data Backup Menu



Once you have instructed CR-ERNS to backup your data as explained above, the system will display the backup data screen on which you must specify the disk drives and directory path of the source files to be backed up, and the destination drive to which the data will be saved.

Once you have specified the source and destination drives, CR-ERNS will prompt you to place a formatted disk in the target drive (if you have not already done so). Press the **<Enter>** key and CR-ERNS will backup the data to the floppy disk. If the disk is not formatted or if the disk drive is empty, the system will generate an error message. If more than one disk is needed to save all of the data, CR-ERNS will inform you how many

disks will be needed. The system will prompt you to place a new disk in the drive as soon as the previous disk is filled.

· Restoring data from backup files will be important when a system or human error has destroyed a portion (or all) of the CR-ERNS data. This procedure is similar to the steps required for data backup. First, select the "**Backup & Restore**" option from the "**System Functions**" menu as illustrated in Exhibit 8.4, and then select the "**Restore Data**" option. As when performing data backup, specify the source and destination drives and paths.

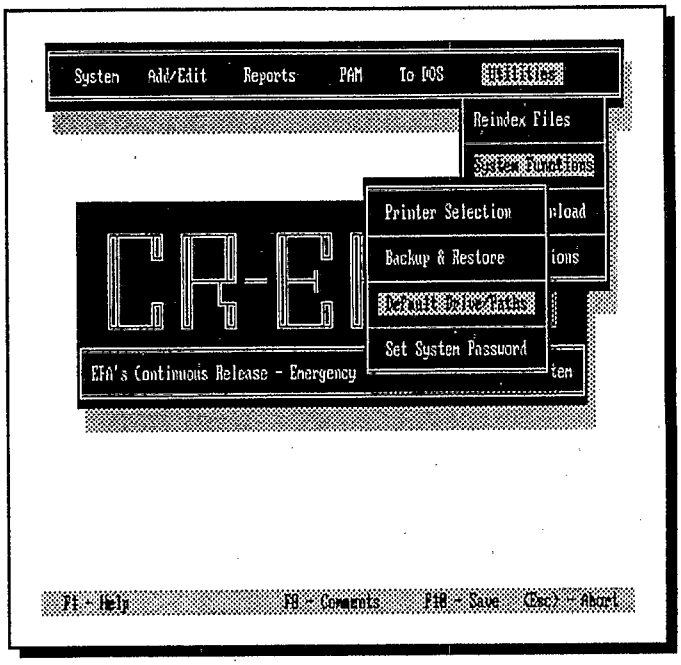
The system will now prompt you to place a backup disk in the source drive. Press the **<Enter>** key and CR-ERNS will restore the data from the floppy disk into the system; if more than one disk is needed, the system will prompt you to place the new disk in when needed.

8.4 Default Drives and Path Setup (System Administrator)

This feature allows the System Administrator to change the disk drives and directory paths used by CR-ERNS and PAM to store data, create reports, access printers, transmit reports, and run PAM.

It is important to note that CR-ERNS assumes that any drives and paths specified exist logically, that is, that they actually exist on the computer. Changing CR-ERNS disk file specifications does not add or delete subdirectories from the computer, nor does it reassign logical drive or device assignments. These activities must be conducted in the DOS environment and should not be changed when accessing DOS through the "**To DOS**" option on the Main Menu.

Exhibit 8.5
Specifying CR-ERNS Drives and Paths'

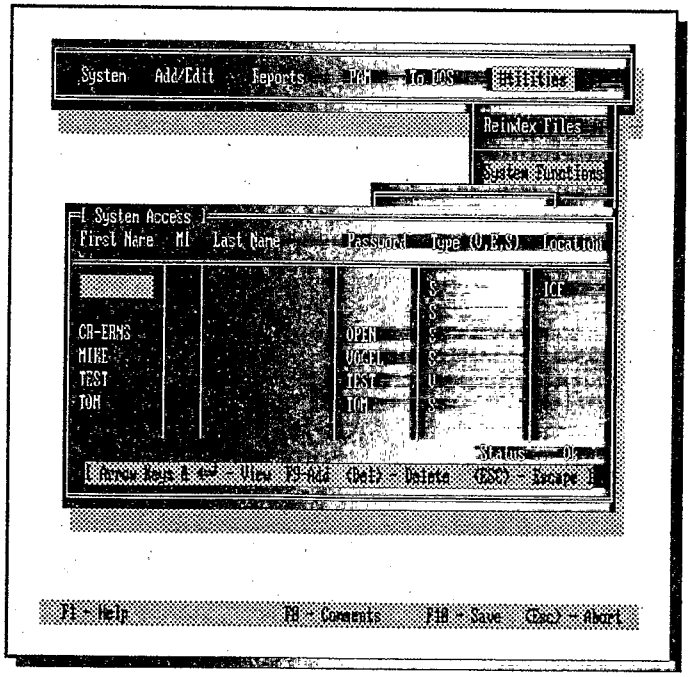


To modify the Disk File Specifications, the System Administration should first create or delete any subdirectories, move files, and add, delete, or change any logical drive or device assignments as necessary. Once this is accomplished, return to CR-ERNS and select the "**Utilities**" option from the Main Menu and then select the "**System Functions**" option; finally, select the "**Disk Drive/Paths**" option (as shown in Exhibit 8.5).

To change the disk file specifications, use your cursor to highlight the desired drive/path combinations. Once you have highlighted the disk file specification that you want to change, press the **<Enter>** key. By typing, you can now edit the current entry and, when finished, press the **<Enter>** key. Repeat this procedure until all the necessary changes have been made.

When you have set the default drives and paths as desired, press the **<ESC>** key to exit. The system will prompt the user twice to verify that you really want to exit. Two **<Y>**es responses will return the system to the Utilities menu. A **<N>**o response to either of these prompts will return the system to the screen shown in Exhibit 8.5.

Exhibit 8.6
CR-ERNS Password Options



8.5 Specifying CR-ERNS Passwords (System Administrator)

CR-ERNS incorporates a password feature (see Exhibit 8.6) to limit entry into the system to only those authorized for its use. In addition, CR-ERNS also allows the System Administrator to limit the number of individuals that can view or change these passwords, or that can edit the HELP screens.

To set the password, select the **"Utilities"** option from the Main Menu by highlighting it and then pressing the **<Enter>** key. Select the **"System Functions"** option from the Utilities menu in a similar manner. Next, select the **"Set System Password"** option from the System Functions menu. At this point, you will be placed in the System Access screen. You may view all of the user's data by using the arrow cursor keys to scroll through the information, add a user password by pressing the **<F9>** key, delete a user by pressing the **<Del>** key, or return to the Main Menu by pressing the **<Enter>** key.

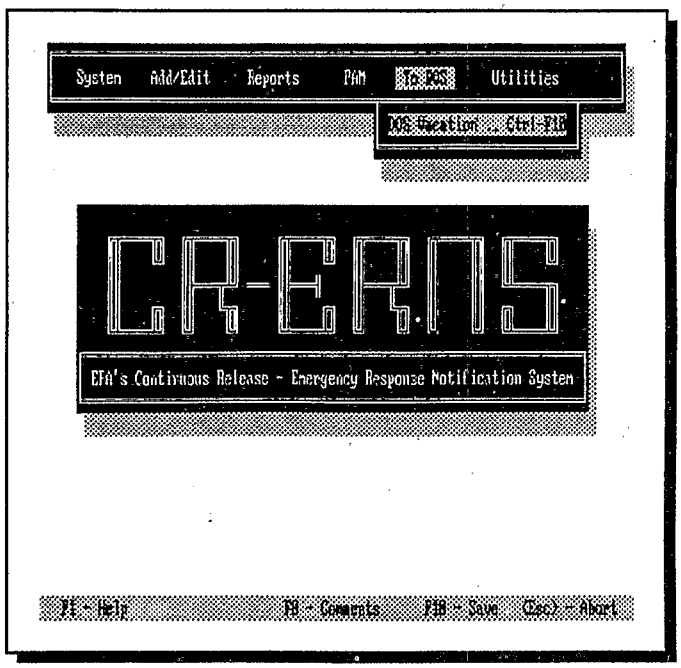
When adding a record, provide the first name, last name, password, access type, and location (if desired). The access type must be either "S" for system-wide access; "E" for edit-access (this option restricts the user with respect to using certain features.); or "V" for viewing access only (this is the most limited access that can be granted.). When you have entered the appropriate data, press the **<F10>** key to save. When deleting a record, CR-ERNS will ask you to verify the action.

8.6 How to Take a DOS Vacation

CR-ERNS allows the user to access the operating system without exiting. The user can then access other software programs, including text editors and spreadsheet programs. DOS Vacation is an advanced menu option and should only be used by those who understand the operating system thoroughly. This function is similar to the "DOS Shell" option on many software packages.

To access the operating system, select the **"To DOS"** option from the Main Menu by highlighting it and then pressing the **<Enter>** key. Next, select the **"DOS Vacation"** option (the only option) in the same manner (as shown in Exhibit 8.7). CR-ERNS will place the user in the DOS environment. At the DOS prompt, note the message above it that says "Press EXIT to return to CR-ERNS". **"Exit"** may be typed at any DOS prompt and the user will be returned to CR-ERNS.

Exhibit 8.7
Exiting to DOS

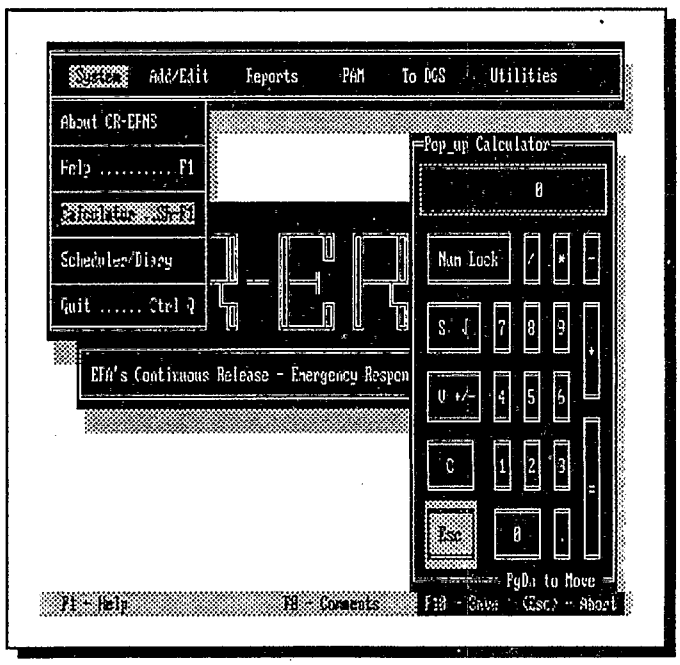


There are two important points to remember when taking a DOS Vacation. First, do not delete any files. You could inadvertently delete the CR-ERNS file and CR-ERNS will not be able to restart. If this happens, return to the Automaxx menu and start CR-ERNS. Use the Reindex utility (explained in Section 8.1) to reindex all the CR-ERNS files before doing any further work. If you absolutely must delete a file, do so in a file by file method rather than using wildcards. Again, this will prevent you from inadvertently deleting the CR-ERNS system file.

Second, remember not to restart CR-ERNS a second time from the Automaxx menu. If this happens, the user should exit CR-ERNS immediately, return to the DOS prompt, and type "**Exit**" (this series of steps will return the user to the original CR-ERNS system). Immediately use the Reindex function to reindex all the CR-ERNS files before doing any further work.

8.7 How to Use the Pop-Up Calculator

Exhibit 8.8
Pop-Up Calculator



CR-ERNS incorporates a simple memory-resident calculator to assist users in making needed calculations while operating the system. For example, it may be useful in checking the validity of data submitted by facilities before entering it into CR-ERNS. Because this function is memory-resident, it can be accessed at any time in CR-ERNS.

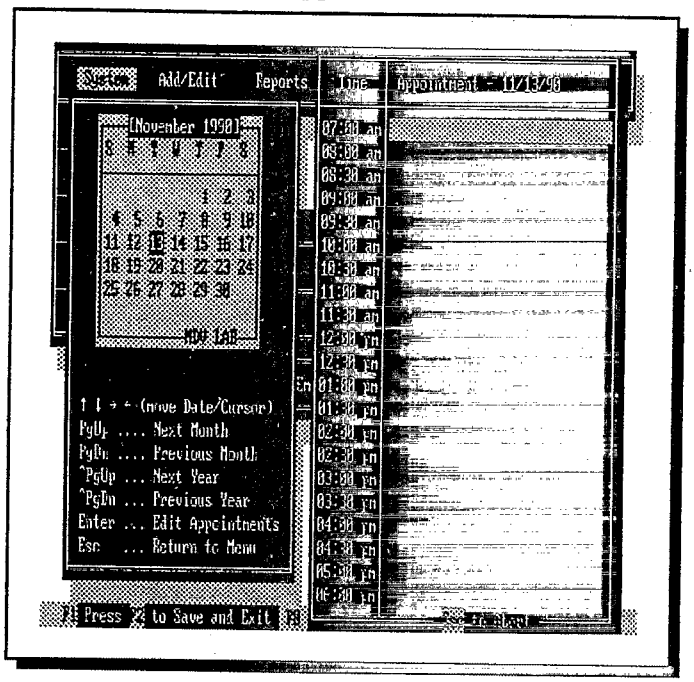
To access the pop-up calculator, press the **<Shift>-<F1>** keys (Exhibit 8.8). The calculator can also be accessed by selecting the "**System**" option from the Main Menu and then selecting the "**Calculator**" option. The calculator can be used to perform simple calculations without leaving CR-ERNS.

8.8 CR-ERNS Appointment Calendar

CR-ERNS also incorporates a pop-up appointment calendar to keep track of important dates or to schedule events. It may be a useful tool for tracking data entry activities or backup schedules.

The Appointment Calendar can be accessed by selecting the "**System**" option from the Main Menu and then selecting the "**Calendar/Diary**" option (illustrated in Exhibit 8.9). To access the appointment section, move to the correct month, day, and year, and press the **<Enter>** key. To write an appointment in the calendar, highlight the time that the appointment starts and type in the note. Press the **<F2>** key to save the note and exit the appointment book, press the **<ESC>** key to exit to leave the appointment book without saving the note.

Exhibit 8.9
CR-ERNS Appointment Calendar



APPENDIX A
CR-ERNS VIRUS PROTECTION

CR-ERNS incorporates a memory-resident virus scanning and elimination program that operates automatically whenever you intend to copy files from a floppy diskette into CR-ERNS. This Appendix contains the unabridged documentation provided by McAfee Associates explaining how to use these programs. Your Regional system contains a licensed version of this software, and thus you have access to all support by McAfee Associates as explained in the documentation. Consult your CR-ERNS System Administrator for assistance if you encounter any indications of a virus in your system. The documentation consists of the following sections:

- VSHIELD, Version 67-B;
- VIRUSCAN, Version 5.3V67C;
- CLEAN-UP VIRUS REMOVER, Version 5.1 V67; and
- VIRUS CHARACTERISTICS LIST, V67.

VSHIELD Version 67-B

NOTE: This product may not be used in a business, corporate, organizational, government or agency environment without a negotiated site license. Contact McAfee Associates for more information at:

(408) 988-3832 - Voice phone;
(408) 970-9727 - FAX; and
(408) 988-4004 - BBS System.

Beginning with Version 67, there are two executable programs packaged with VSHIELD. Either one may be used, but not simultaneously.

VSHIELD1.EXE (Version 0.1) provides a first level of protection by checking program validation codes that have been attached by SCAN. It will not allow any program to execute if the validation codes have changed.

VSHIELD.EXE (Version 2.3V67) will scan for specific virus signatures and identify the virus if one exists in addition to providing validation code checking.

Executable Programs (VSHIELD.EXE and VSHIELD1.EXE):

VSHIELD is packaged with a VALIDATE program that will authenticate the integrity of the executable programs. Refer to the VALIDATE.DOC instructions for the use of the validation program.

The validation results for V67-B should be:

PROGRAM NAME:	VSHIELD.EXE	VSHIELD1.EXE
SIZE:	25,971	10,743
DATE:	10-12-1990	10-04-1990
FILE AUTHENTICATION:		
CHECK METHOD 1:	8443	B887
CHECK METHOD 2:	1A0A	006C

You may also call the McAfee Associates bulletin board system at (408) 988-4004 to obtain on-line VSHIELD.EXE verification data. The VALIDATE program distributed with VSHIELD may be used to authenticate all future versions of VSHIELD.

IMPORTANT: First place VSHIELD1.EXE and VSHIELD.EXE on a write-protected diskette prior to installing it. This will give the user a valid backup copy in the event that the programs become infected.

Notes on Version 67-B:

Version 67-B fixes a bug that caused VSHIELD to incorrectly perform the CRC check on the boot sector and partition table under some circumstances.

INTRODUCTION AND INSTALLATION

VSHIELD is a memory resident system that prevents viruses from infecting your computer. It provides three levels of protection that are user-selectable:

I. Checks CRC validation codes that have been attached by the McAfee Associate's SCAN program. Programs that have been altered will not be allowed to execute.

II. Checks for virus signatures in memory, the boot sector, partition table and and all programs before they are executed. Infected programs will not be allowed to execute and VSHIELD will not allow booting from a diskette infected with any boot sector or partition table virus.

III. Checks both for viruses signatures and for CRC codes.

Level I:

Level I protection is provided by the VSHIELD1.EXE program. It is a minimal memory resident module that requires 6K of memory. VSHIELD1 requires the least amount of system overhead and is the most non-intrusive approach to protection.

VSHIELD1 will check the operating system and the CRC values of all programs before they are allowed to execute. VSHIELD1 will optionally check the boot sector and partition table CRC values. Any program which no longer matches its CRC value will not be allowed to execute.

To implement Level I protection, place VSHIELD1.EXE as the LAST entry in the AUTOEXEC.BAT file. The syntax for the program is:

VSHIELD1 /NB

/NB is an optional parameter that tells VSHIELD1 not to check the boot sector or partition table

Levels II and III:

Levels II and III are provided by the VSHIELD.EXE program. To install VSHIELD.EXE, place the following line as the LAST entry in your AUTOEXEC.BAT file:

VSHIELD /CV /SWAP "pathname" /F "pathname" /NB /NOMEM /X

/CV tells VSHIELD to check CRC values as well as specific virus signatures. If this option is not selected, VSHIELD will default to level II protection.

/SWAP is an optional parameter that tells VSHIELD to install only its kernel as memory resident. The remaining functions will be swapped in and out of memory as needed, from a hard disk or RAM disk. The SWAP paramater may also use an optional pathname to specify where the swap file should be kept. The default path is the VSHIELD home directory.

NOTE: Only use the SWAP parameter if your system has limited free memory space available for memory-resident programs. VSHIELD requires 34K in non-swap mode. With the SWAP parameter set, VSHIELD requires less than 3K of resident memory.

/F is a required parameter if the SWAP function is used on a system running DOS 2.0 or earlier. The /F parameter tell VSHIELD where it has been loaded from.

/NB is an optional parameter that tells VSHIELD not to check the boot sector of floppies for viruses on reboot. This option should ONLY be used if the reboot check conflicts with other memory resident programs or the system BIOS.

/NOMEM is an optional parameter that tells VSHIELD not to perform a memory scan as it loads.

/X tells VSHIELD to check for extinct viruses.

Examples:

VSHIELD /NB
To disable boot sector and partition table checking.

VSHIELD /SWAP /CV
To swap VSHIELD in memory and check validation codes.

VSHIELD /SWAP D:\PROGRAMS
To swap VSHIELD from D:\PROGRAMS subdirectory.

VSHIELD /SWAP /F C:\
To swap VSHIELD on a machine running DOS 2.0.

VSHIELD /NB /NOMEM /X
To disable boot sector and memory checking, and check for extinct viruses.

NOTE: Do not run VSHIELD.EXE and VSHIELD1.EXE at the same time. Select the level of protection you wish to use and install one of the programs only.

OPERATION:

When VSHIELD is placed in the AUTOEXEC.BAT file, it will become active each time the system is powered-on or re-booted. It will check the critical areas of the system for viruses and then monitor all program loads. As programs are loaded, VSHIELD will scan the programs looking for viruses. If a virus is found, VSHIELD will display a warning message for Level I protection and will

name the infection if running Level II or III protection. Execution of the infected program will be halted, preventing viral infection.

Levels I, II and II will scan specific areas of the system: the boot sector, partition table, hidden and system files, command interpreter, and the VSHIELD executable when VSHIELD is first executed. Thus, if the power is turned off and then the system is booted from an infected floppy (while VSHIELD is not running), VSHIELD will detect any infection the next time VSHIELD is loaded. VSHIELD levels II and III will also prevent boot sector and partition viruses from entering the system by trapping each warm-boot request (Ctrl-Alt-Del), and preventing re-boots from infected diskettes.

VSHIELD version 67 can identify and prevent infection from 141 major virus strains and 220 sub-strains. The 220 viruses include the ten most common viruses which account for over 95% of all reported PC infections. The complete list (in order of most recent appearance) is outlined in the accompanying file:

VIRLIST.TXT.

In addition, when running VSHIELD in CRC checking mode, it will prevent unknown viruses from entering the system, provided that the system files have had the CRC checks added to them by VIRUSCAN.

When an infection is identified, the VIRUSCAN non-resident system scanner should be used to scan the entire system and determine the extent of the infection. If you do not have the VIRUSCAN non-resident program, it may be downloaded from the HomeBase BBS at 408 988 4004.

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MEMORY RESIDENT and NETWORK CONFLICTS:

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VSHIELD.EXE or VSHIELD1.EXE should be loaded as the last entry in the AUTOEXEC file. It is recommended that VSHIELD.EXE be used in non-swap mode if memory permits. Use of the swap option may increase the chances of conflicts with other memory resident programs. If conflicts occur while using the /SWAP option of VSHIELD, then remove the option and re-boot the system. If insufficient memory is available for use of VSHIELD.EXE in non-swap mode, then it is recommended that Level I protection be implemented by loading VSHIELD1.

When running local area networks, be sure that VSHIELD is loaded AFTER the network drivers on each workstation. Otherwise, the program will not properly protect the network.

ERROR LEVELS:

VSHIELD sets the DOS error level after it becomes resident. If it finds a virus in the boot sector, operating system, or itself prior to going resident, it sets the error level thus:

No viruses found - 0
One or more found - 1
System Error - 2

REMOVING VSHIELD:

VSHIELD.EXE may be removed from memory by issuing the following command:

VSHIELD /REMOVE

This will de-install the program and remove it from memory. If there are other memory resident programs that have hooked the same interrupts as VSHIELD and which have been loaded after VSHIELD, it may not be safe to remove the program and VSHIELD will not de-install. An error message will be displayed in this instance.

VSHIELD1.EXE may not be removed from memory.

SYSTEM OVERHEAD:

VSHIELD.EXE requires 3K of system memory when used in swap mode. It requires 34K if used in non-swap mode. It will add an average of 4 seconds to each program load, and 6 seconds to each re-boot. Swap mode will add an additional 600 milliseconds to each program load. After a program has loaded and begun execution, however, VSHIELD will not degrade the performance or speed of the system in any way.

It is recommended that VSHIELD.EXE be used in the non-swap mode where memory availability permits.

VSHIELD1.EXE requires 6K of system memory. It adds an average of 1 second to each program load.

Registration:

A registration fee of $25 is required for the use of VSHIELD by individual home users. Please send registrations to the address below. This registration covers the copy currently in use and future versions for one year, providing they are obtained from the McAfee Associates bulletin board or other public or private board. Diskettes will not be mailed unless specifically requested. Add $9 for diskette mailings. The McAfee Associates board number is: (408) 988-4004, 1200/2400 baud, 8N1 line settings, 5 lines.

Corporate and organizational use:

Corporate site licenses are required for corporate, agency and organizational use. For site license information contact:

McAfee Associates
4423 Cheeney Street
Santa Clara, CA 95054
(408) 988-3832 voice
(408) 970-9727 fax

Virus Removal:

What do you do if a virus is found? Well, if you are a registered VIRUSCAN or VSHIELD user, you may contact McAfee Associates for free assistance in manually removing the virus. We strongly recommend that you get experienced help in dealing with many of the viruses, particularly partition table and boot sector infections. If you are not a registered user, the following steps should be followed:

Boot sector infections: Power down the system. Power up and boot from an uninfected, write protected floppy. Execute the DOS SYS command to attempt an overwrite of the boot sector. This works in many cases. If this does not work, backup all data files and perform a low level format of the disk.

Executable file infections: Remove all infected files. Replace from the original distribution diskettes.

Partition table infections: Without a removal utility, the only option is to low level format the media.

Disinfecting utilities are available from McAfee Associates for the majority of the common viruses. If you are not a registered user of VIRUSCAN, you may purchase these utilities from:

McAfee Associates
4423 Cheeney Street
Santa Clara, CA 95054
408 988 3832

BBS: 408 988 4004

Version Notes

Version 66: Version 66 now prevents infection from 31 new viruses discovered since version 64. Please refer to VIRLIST.TXT for a schematic description of the new viruses.

Version 64: Version 64 has been completely re-designed to reduce required memory and to speed the virus checking process. VSHIELD now uses an overlay structure that requires less than 3K of resident memory space, using the /SWAP parameter, and the processing time has

been reduced by 20%. All anti-virus functions, including boot virus protection, have been retained.

Version 63: Version 63 has been one of the most painful versions we have put together. There have been 17 new viruses and virus sub-strains discovered in the 35 days since the release of version 62-B.

In addition, we've been struggling with the issue of how to count viruses in a meaningful way that does not place us in a seemingly disadvantageous competitive position. For example: Numerous anti-virus programs advertise the number of viruses that they are able to block, and these numbers range from less than 50 to over 100. On analysis, these numbers included all of the known sub-strains of the viruses, and their virus count by our classification was always substantially less. We group viruses by major type, where possible, to make it easier to manage, both from an identification and removal basis. But on a sheer numbers comparison, VSHIELD appears in a weaker light. After careful thought, we decided to stick with our classification scheme, but in the VIRLIST.TXT we will list the known variants detected in parentheses. By the competition's counting scheme, we now block 167 viruses. By our count, we block 97.

The 17 new viruses and new sub-strains added for version 63 have come from a variety of sources. Vesselin Bontchev from Bulgaria submitted three new variants of the 512, one new variant of the W-13 virus and two entirely new viruses that have surfaced in Eastern Europe. Dave Chess from IBM provided me with three new viruses collected through the various IBM contacts. Patricia Hoffamn provided one new virus and two new variants submitted from users of the FidoNet network. The Icelandic virus researcher Fridrik Skulason provided one new virus. The remaining four were submitted directly by Homebase users. The VIRLIST.TXT document describes the main operating characteristics of the new viruses. To avoid duplication of effort, I am referring users to Patricia Hoffman's most current VSUM document for a detailed description of the new viruses. This document may be obtained from most bulletin boards.

VIRUSCAN Version 5.3V67C

McAfee Associates
4423 Cheeney Street
Santa Clara, CA 95054
408 988 3832 (phone)
408 970 9727 (fax)
408 988 4004 (BBS)

EXECUTABLE PROGRAM (SCAN.EXE):

SCAN contains a self test at load time. If SCAN has been modified in any way, a warning will be displayed. The program will still continue to check for viruses, however. In addition, versions 46 and above are packaged with a VALIDATE program that will authenticate the integrity of SCAN.EXE. Refer to the VALIDATE.DOC instructions for the use of the validation program.

The validation results for V67-C should be:

SIZE: 66,605
DATE: 10-15-1990

FILE AUTHENTICATION:

Check Method 1 - B87A
Check Method 2 - 1226

You may also call the McAfee Associates bulletin board at 408 988 4004 to obtain on-line SCAN.EXE verification data. The VALIDATE program distributed with SCAN may be used to authenticate all future versions of SCAN.

Notes on Version 67-C: Sorry about this third release of V67. 67B had problems scanning floppy diskettes that were write-protected, bootable system diskettes. 67-C fixes it.

Notes on Version 67-B: Version 67-B fixes a minor bug that caused VSHIELD.EXE to incorrectly CRC check the boot sector and partition table.

Notes on Version 67: Our apologies for the delay in releasing V67. At the last minute a major new virus -- the Invader -- was reported at multiple sites across the U.S. and in Asia. We have included a detector and remover for this virus in V67 SCAN and CLEAN.

Version 67 has added a report feature to allow the creation of a report file containing a list of found infected files when scanning an infected system. We have also implemented an EXTINCT switch that defaults to not searching for viruses that have become extinct or viruses that are exclusively research viruses. Any virus that has not been reported in the public domain for more than a year has been classified as extinct. Extinct viruses are marked with an asterisk in the VIRLIST.TXT file that accompanies the SCAN program. If you are a researcher and have any of the extinct viruses, you must

use the /X switch to force SCAN to search for them. In addition, 10 new viruses have been added to the list of viruses that are identified by SCAN. These viruses are outlined in the VIRLIST.TXT file.

INTRODUCTION:

VIRUSCAN scans diskettes or entire systems and identifies any pre-existing PC virus infection. It will indicate the specific files or system areas that are infected and will identify the virus strain which has caused the infection. Removal can then be done automatically using the SCAN /D option. If the infection is widespread, automatic disinfector utilities are available which can remove the infected segment of files and repair and restore the infected programs.

SCAN version 5.1V67 can identify all 144 known virus strains and 223 virus sub-strains (varieties). The 223 viruses include the ten most common viruses which account for over 95% of all reported PC infections. The complete list (in order of most recent appearance) can be found in the accompanying file: VIRLIST.TXT. The VIRLIST.TXT file lists and describes the 111 major strains and includes the number of known variants of each strain in parentheses.

All known viruses infect one of the following areas: The hard disk partition table; the DOS boot sector of hard disks or floppies; or one or more executable files within the system. The executable files may be operating system programs, system device drivers, .COM files, .EXE files, overlay files or any other file which can be loaded into memory and executed. VIRUSCAN identifies every area or file that has become infected and indicates the name of the virus that has infected each file. VIRUSCAN can check the entire system, an individual diskette, a sub-directory or an individual file for an existing virus.

****

NOTE:

If you are a virus researcher and have access to extinct or research-only viruses, you should use the /X switch in SCAN to force searching for research and extinct viruses.

****

OPERATION:

IMPORTANT: Always place VIRUSCAN on a write protected floppy prior to using it. This will prevent the program from becoming infected.

To run VIRUSCAN type:

SCAN d1: ... d10: /NLZ /M /D /A /E .xxx /NOMEM /MANY /AV /RV /CV/X /REPORT <filename>

(d1-d10 indicate multiple drives that may be scanned)

Options are:

/NLZ - Do not scan inside compressed LZEXE files
/D - Overwrite and Delete infected files
/M - Scan memory for all viruses
(See restrictions below)
/A - Scan all files
/E .xxx .yyy - Scan listed overlay extensions
/NOMEM - Skip memory scan
/MANY - Scan multiple floppies
/AV - Add validation codes to specified files
/RV - Remove validation codes from files
/CV - Check validation codes
/X - Search for extinct viruses
/REPORT filename - Send report to named file

VIRUSCAN will check each area or file on the designated drive that could be a host to a virus. If a virus is found, the name of the infected file or system area will be displayed, along with the name of the identified virus.

VIRUSCAN will perform both an internal and an external scan on programs that are compressed with LZEXE. The compressed file will first be scanned externally and then it will be automatically de-compressed and scanned again for an internal infection. The/NLZ option will disable the decompression and internal scan function.

If the /D option is selected, SCAN will pause after each infected file is displayed and will ask whether you wish to remove the infected file. If <Y> is selected, the file will be overwritten with the hex code C3 (the Return instruction), and then deleted. This option is disallowed for boot sector and partition table infections. Use the shareware M-DISK utilities to remove boot sector or partition table viruses.

If the /M option is chosen, SCAN will search the first 640K of memory for all known memory resident viruses. Selecting this option may cause false alarms if you are running SCAN in conjunction with any other virus detection utility. It will also add from 12 seconds to 1 minute to the scanning time. If the /M option is not chosen, SCAN will in any case check memory for the Dark Avenger virus. If the Dark Avenger is found in memory, SCAN will display a warning message, with instructions to power down and re-boot from a clean floppy.

>>> Do not use the /M option if you are running SCANRES V42 or earlier. Please upgrade SCANRES to the current version first. Otherwise false alarms will result.

Use the /E option to scan specified overlay files. Scan will default to OVL, OVG, OV1, OV2, OVR, SYS, BIN and PIF. Scan will search these overlay files for any viruses capable of infecting overlays. If you are using an application with overlay extensions other than the defaults, then specify the extension names (up to three) using the /E option. Example:

SCAN C: /E .ABC .XYZ .123

It is important to note that viruses that infect overlays always infect the original .COM, .EXE, .BIN or .SYS files that call the overlay. So the virus will always be discovered whether or not the overlay is scanned. To get rid of the virus, however, you must identify and remove it from overlays. If you do not know whether an application uses overlay files, and SCAN has discovered one of the viruses capable of infecting overlays, then use the /A option to search all files.

NOTE: The /A option will require a substantial amount of time to complete the scan. Use it only after a .COM or .EXE infection has been discovered by VIRUSCAN, or when a new diskette or set of program files is to be scanned.

VALIDATION CHECKING FOR UNKNOWN VIRUSES:

Version 66 and above allow the user to add validation codes to specified files or areas of the system. All COM and EXE files, as well as the boot sector and partition table can be validated. The validation process adds 10 bytes to each validated file. To validate the entire disk type:

SCAN d: /AV

This command will cause SCAN to add the validation codes to all COM and EXE files. SCAN will also create a hidden file in the root of the designated drive that contains validation information for the partition table, the boot sector, and COMMAND.COM. The command:

SCAN d:\TEMP\NEWFILE.EXE /AV

will cause SCAN to add a validation code to the file NEWFILE.EXE.

Note: SCAN will not create the file containing codes for the boot sector and partition table unless the entire disk is selected for validation.

To remove the validation codes from validated files, use the /RV option. To cause SCAN to check the validation codes, use the /CV option. the /AV, /RV, and /CV options may be used in conjunction with any other SCAN options.

VIRUSCAN will require approximately 3 minutes of run time for each 1,000 files on the designated drive. If the /CV option is selected, the run time will increase by 25%.

WARNING: Some systems, notably older Zenith PCs and some Hewlett Packard models, use a non-standard boot sector or partition table program. These programs may modify the boot sector or partition table each time the system is booted. If you are experiencing a warning flag from SCAN indicating continual changes in your boot sector or partition table, refer to your system's owner's guide to determine whether your system uses such a self-modifying boot program.

Exit Codes:

SCAN will exit with the following exit codes:

0 - Normal termination, no viruses found
1 - One or more viruses found
2 - Abnormal termination (Error)

Registration:

A registration fee of $25 is required for the use of VIRUSCAN by individual home users. Please send registrations to the address below. This registration covers the copy currently in use and any future versions for one year, providing they are obtained from the McAfee Associates bulletin board or other public or private board. Diskettes will not be mailed unless specifically requested.

Add $9 for diskette mailings. The McAfee Associates board number is - 408 988 4004 - 1200/2400, N,8,1; 5 lines.

Corporate and organizational use:

Corporate site licenses are required for corporate, agency and organizational use. For site license information contact:

McAfee Associates
4423 Cheeney Street
Santa Clara, CA 95054
408 988 3832

Scanning Networks:

VIRUSCAN works only on stand-alone PCs. If you are in a corporate environment using local area networks you will need to run NETSCAN. NETSCAN is not a shareware product. Site licenses are available for NETSCAN through McAfee Associates - 408 988 3832.

Virus Removal:

What do you do if a virus is found? Well, if you are a registered VIRUSCAN user, you may contact McAfee Associates for free assistance in manually removing the virus or for information on disinfection utilities. Automatic disinfectors are available for the majority of the known viruses and are available from McAfee Associates. We strongly recommend that you get experienced help in dealing with many of the viruses, particularly partition table and boot sector infections. If you are not a registered user, the following steps should be followed:

Boot sector infections:

Power down the system. Power up and boot from an uninfected, write protected floppy. Execute the DOS SYS command to attempt an overwrite of the boot sector. This works in

many cases. If this does not work, backup all data files and perform a low level format of the disk.

Executable file infections: Power down system. Boot from clean, write protected floppy. Remove all infected files. Replace from the original distribution diskettes.

Partition table infections: Without a removal utility, the only option is to low level format the media.

Disinfecting utilities are available from McAfee Associates for the majority of the common viruses. These utilities remove the virus and repair the infected files. If you are not a registered user of VIRUSCAN, you may purchase these utilities from:

McAfee Associates
4423 Cheeney Street
Santa Clara, CA 95054
408 988 3832

BBS: 408 988 4004

INTERNATIONAL AGENTS:

International agents for licensing and support of the SCAN series of products are available in the following areas:

Europe: Kirschbaum Software - Kronau, Fed. Repub. of Germany
Josef Kirschbaum
Tel: 08067/1016
Fax: 08067/1053

Australia: Computerware for Micros - Stepney, South Australia
Peter Collison
Tel: (08) 362 8200
Fax: (08) 363 1974

Doctor Disk - Perth, Australia
Rob Edwards
Tel: (09) 328 2011
Fax: (09) 328 9611

Asia: Acer Inc. - Taipei, Taiwan
Jack Hwang
Tel: (02) 501 0055
Fax: (02) 501 2521

VERSION NOTES

Version 66-B: Version 66-B fixes a bug in the validation removal processing of SCAN. Version 66 would not remove validation codes from validated files unless the /CV option were set. Version 66-B fixes this problem. It also fixes a bug that caused inconsistent results when certain files (PKZIP is one example) were validated. If you have already used V66 to validate your files, then use 66-B to remove the validation codes put in place by V66 (using /RV), and then restore the validation codes using the /AV option. We regret any inconvenience this may have caused.

Version 66: We skipped version 65 since a trojan version 65 of SCAN appeared on a few bulletin boards in March of this year. Better safe than sorry. So this version logically follows version 64 of SCAN.

This version of SCAN has added an option to transparently attach a CRC validation code to all of your executable files, your boot sector and your partition table. This will help protect your system in case a virus unknown to SCAN is encountered. SCAN will check these validation codes if requested and will alert the user to any files or system areas that have changed. Subsequent versions of VSHIELD (Version 67 and above) will also check this validation field if present, and will prevent programs infected with unknown viruses from executing.

Version 66 has added 31 new viruses to the list of known viruses, bringing the current total to 213 viruses. We have also added the Joshi, Fish6, Vienna and Zerobug to the list of viruses that can be non-destructively removed from your system by Clean-Up. All four of these viruses are becoming widespread.

Of interest in this release are two new viruses that infect both executable programs and boot sectors. The 1253 virus, which activates on December 24th, infects boot sectors of floppies, the partition table of hard disks and any COM files in the system, including COMMAND.COM. The virus originated in Eastern Europe. It is very destructive. The second virus has been named Anthrax, and is also from Eastern Europe. This virus infects COM files, EXE files and the partition table of the hard disk. Both viruses are difficult to remove without appropriate detectors and removers.

The list of all new viruses added to the SCAN list are included in the enclosed file - VIRLIST.TXT. For a detailed description of each of these viruses, please refer to Patti Hoffman's VSUM document. VSUM is copyrighted by Patricia Hoffman.

Version 64: Version 64 of SCAN repairs a number of small bugs in version 63, including the inability to catch the Fish-6 virus in memory and an infrequent false alarm with the Korea virus when running AppleTalk. We have also re-designed VSHIELD so that it uses an overlay structure and now only occupies 2.9K of memory. A re-structuring of our scanning technique was also required due to the appearance of another fully encrypted virus (V2P2). This virus has no string that is common for all iterations of the virus, so that a virus-specific search technique was required.

In addition, 14 new viruses have surfaced from various parts of the world. Of the 14 viruses, two appear to be fairly virulent. The Joshi virus, from India, is a boot sector and partition table infector which activates on the 5th of January. When activated, it locks up the machine and displays the message "Type Happy Birthday Joshi". The system stays locked until the user types the happy birthday message. In addition the virus causes problems in writing to or reading from 1.2Mb diskettes.

The second virus is from Taiwan and has been named the Taiwan-3 virus. It infects EXE and COM files, including COMMAND.COM. It is memory resident and randomly appears to garble the File Allocation Table of the hard drive. Both viruses have been reported at multiple sites.

The twelve additional viruses are outlined in the enclosed VIRLIST.TXT file. For a detailed description of each, please refer to Patricia Hoffman's VSUM document.

CLEAN-UP VIRUS REMOVER Version 5.1 V67

4423 Cheeney Street
Santa Clara, CA 95054
408 988 3832 (voice)
408 988 4004 (BBS)

EXECUTABLE PROGRAM (CLEAN.EXE):

CLEAN contains a self test at load time. If CLEAN has been modified in any way, a warning will be displayed. The program will still continue to repair and clean infected programs, however. In addition, versions 55 and above are packaged with a VALIDATE program that will authenticate the integrity of CLEAN.EXE. Refer to the VALIDATE.DOC instructions for the use of the validation program.

The validation results for V67 should be:

SIZE: 92,065
DATE: 10-05-1990

FILE AUTHENTICATION:

Check Method 1 - 7F1A
Check Method 2 - 0D91

You may also call the McAfee Associates bulletin board at 408 988 4004 to obtain on-line SCAN.EXE verification data. The VALIDATE program distributed with CLEAN may be used to authenticate all future versions of CLEAN.

Notes on Version 67: Version 67 is able to remove and repair four new viruses: Whale, Invader, Slow, and EDV.

OVERVIEW:

CLEAN-UP kills and removes computer viruses, and in most instances it repairs infected files, re-constructs damaged programs and returns the system to normal operation. CLEAN-UP works for all viruses identified by the current version of McAfee Associates' SCAN.

CLEAN-UP searches the entire system looking for the virus that you wish to remove. When found, the infected file is identified, the virus is isolated and removed, and for the more common viruses, the infected file is repaired. If the file is infected with a less common virus that cannot be separated from the file, the infected file is wiped from the disk and deleted from the system. A warning message is displayed by CLEAN-UP before erasing any files, and you have the option of overriding the erase function.

The common viruses that CLEAN-UP is able to remove successfully and repair and restore the damaged programs are:

Jerusalem B	Alabama	Jerusalem A	Ping Pong
Jerusalem E	Stoned	Dark Avenger	Pakistani Brain
Suriv03	Payday	Alameda	1701
1704	Disk Killer	Ping Pong-B	Ashar
Sunday	1260		4096Yankee Doodle
Vacsina	V800		JoshiFish
Vienna	Zerobug	Whale	Invader
Slow	EDV		

These viruses account for the overwhelming majority of infection occurrences. All other known viruses will be identified and isolated by CLEAN-UP and the infected files' area of disk will be wiped clean and the files will be removed from the system.

****** IMPORTANT ******

* Note: EXE viruses cannot be successfully removed from all infected. EXE files in 100% of the cases. A few EXE programs will be damaged beyond repair by the infection and they will have to be deleted. In all cases, however, the virus in the file will be killed and rendered harmless by CLEAN-UP. Additionally, removing the Stoned virus can cause loss of the partition table in systems with non-standard disk controllers or systems that use special purpose device drivers for disk access. If you are removing the Stoned virus, as a precaution back-up all critical data before running Clean-up. Loss of the partition table will cause -- LOSS OF ALL DATA ON THE DISK.

******* FOLLOW THE REMOVAL INSTRUCTIONS CLOSELY *******

* POWER DOWN AND RE-BOOT FROM A CLEAN DISKETTE BEFORE BEGINNING *

RUNNING CLEAN-UP:

Before running CLEAN-UP, verify the suspected virus infection by running VIRUSCAN (SCAN.EXE) Version 55 or greater. SCAN will identify the virus strain and sub-strain and will display the I.D. to be used as input to the CLEAN-UP program. CLEAN-UP uses this I.D. to determine which virus to seek out and remove. The I.D. for each virus is displayed inside a set of brackets - [ ]. For example, the I.D. for the Disk Killer virus will be displayed by SCAN as [Killer]. This identical identifier must be used in the command line of CLEAN-UP in order to remove the Disk Killer virus.

*** **Important** ***: Before you begin the disinfection process, you MUST power down the infected computer and then re-boot the computer from a clean, write-protected system diskette. This step is very important. It will remove the virus from control in memory and prevent the virus from continuing to infect during the clean-up process. After Re-booting from the clean diskette, run SCAN on the diskette to verify that it is indeed not infected.

To run CLEAN-UP type:

CLEAN d1: d2: ... dn: [virusname] /a /many

where:

dn: - Drive designators for drives to be cleaned.
(up to 10 drives may be cleaned with one command)

[virusname] - The virus I.D. (brackets must be included)

/a - Option to check all files

/many - Option to allow cleaning multiple floppies

Examples:

CLEAN C: D: [Jeru] will clean Jerusalem from C and D drives

CLEAN C:\TEMP [Dav] /a Will clean Dark avenger from C:\TEMP and will search all file extensions for the virus

CLEAN-UP will display the name of each infected file as it is found. When the virus has been removed from each file, a "successful" message will be displayed.

NOTE: If a file has been infected multiple times by a virus, clean will display the name of the file and the "successful" message for each infection occurrence. Thus, multiple lines will be displayed for each file infected more than once.

After running CLEAN-UP, run SCAN again, this time with the /a option, to ensure that all remnants of the virus have been removed.

After cleaning the fixed disk drives, SCAN all floppies and if any infections are found, remove them with CLEAN-UP.

The clean-up I.D.'s for each of the known viruses are listed in brackets below:

Oropax [Oro]
4096 [4096]
AIDS Trojan [AIDS]
Amstrad [Amst]
Holland Girl [Holland]
Do-Nothing virus [Nothing]
Lisbon virus [Lisb]
DBASE virus [Dbase]
Ghost COM Version [Ghost-C]
Alabama [Alabama]
2930 [2930]
AIDS / Taunt [Taunt]
1536 / Zero Bug [Zero]
Dark Avenger [Dav]
Vacsina [Vacs]
Typo
Datacrime II [Crime-2]
Pentagon
Datacrime-B [Crime-B]
Saratoga [Toga]
1704 Format [170X]
1280 / Datacrime [Crime]
1704 / Cascade-B [170X]
1704 / Cascade [170X]
Den Zuk
Vienna-B [Vienna-B]
Vienna / DOS-62 [Vienna]
Yale / Alameda [Alameda]
Jerusalem-A / 1813 [Jeru]
Suriv02 [jeru-D]
Taiwan [Taiwan]
Perfume [Fume]
Icelandic-3 [Ice-3]
Virus-101 [101]
Saturday 14th [Sat14]
1210 [1210]
1392 [1392]
2000-B [Solano]
Yankee-2 [Doodle2]
June 16th [June16]
Murphy [Murphy]
Fish-6 [Fish]
Frere Jacques [frere]
W-13 [W13]
Victor [Victor]
Pakistani Brain [Brain]
Chaos [Chaos]
Virus-90 [90]
Devil's Dance [Dance]
Datacrime II-B [Crime-2B]
Sunday virus [Sunday]
Typo COM virus [Typo]
Ghost / Ghostball Boot
New Jerusalem [Jeru]
Yankee Doodle [Doodle]
Ashar [Brain]
Disk Killer / Ogre [Killer]
MIX1 [Mix1]
3551 / Syslock [Syslock]
Ohio
Swap / Israeli Boot
Icelandic-II / System [Ice-2]
3066 / Traceback [3066]
Icelandic [Ice]
405 [405]
Fu Manchu / 2086 [Fu]
1701 / Cascade [170X]
Stoned / Marijuana [Stoned]
Ping Pong-B / Cascade Boot [Ping]
Ping Pong / Bouncing Dot [Ping]
Lehigh [Lehigh]
Jerusalem-B [Jeru]
Friday 13th COM virus [13]
Suriv03 / Jerusalem-E [Jeru]
Suriv01 [April]
Halloechen [Hal]
Joker [Joke]
1260 [1260]
V2000 [2000]
1720 [1720]
Christmas Tree [XA1]
Korea [Korea]
Kennedy [Kennedy]
Eight Tunes [1971]
V800 [800]
Shake [Shake]
Liberty [Liberty]
Slow [Slow]
JoJo [JoJo]
5120 [5120]

June 13 [J13]
Print Screen [Prtscr]
Joshi [Joshi]
RedX [RedX]
Sorry [Sorry]
Aramagedon [Arma]
VHP [VHP]
1008 [1008]
Fellowship [Fellow]
Doom2 [Dm2]
Plastique [Plq]
1226 [1226]
P1 [P1]
AirCop [AirCop]
Mardi Bros. [Mardi]
651 [651]
Casper [Casper]
Leprosy-B [Lepb]
Wisconsin [Wisc]
Black Monday [BMON]
Whale [Whale]
Form [Form]
Microbes [Micro]
Vp [VP]
1024 [1024]
1381 [1381]
Taiwan-3 [T-3]
Stoned-II [S-2]
Flash [Flash]
Flip [Flip]
Wolfman [Wolf]
V2100 [2100]
Ontario [Ont]
400 [400]
1253 [1253]
TCC [TCC]
Anthrax [Atx]
Burger [Burger]
Christmas-J [C-J]
Sott's Valley [2133]
1605 [1605]
Nomenclature [Nom]

REGISTRATION: CLEAN-UP is a required registration shareware product. It may be use in a home environment for a registration fee of $35. Please use the enclosed REGISTER.DOC file for registration information. For corporate, organizational or agency use, however, a corporate site license is required. For site license information please contact:

McAfee Associates
4423 Cheeney Street
Santa Clara, CA 95054
408 988 3832 (voice)
408 988 4004 (BBS)
408 970 9727 (Fax)

VERSION NOTES

Version 66: Version 66 is able to remove and repair four new viruses: Joshi, Vienna, Fish6, and Zerobug. All of these viruses have been reported at multiple sites. In addition, 27 new viruses have been included in the Clean-Up detection and eradication processing. An outline of the new viruses in included in the enclosed file - VIRLIST.TXT. For a complete description of the viruses, please refer to Patricia Hoffman's VSUM document.

Version 64: Version 64 of CLEAN repairs a number of small bugs in version 63, including the inability to catch the Fish-6 virus in memory and an infrequent false alarm with the Korea virus when running AppleTalk. A re-structuring of CLEAN's scanning technique was also required due to the appearance of another fully encrypted virus (V2P2). This virus has no string that is common for all iterations of the virus, so that a virus-specific search technique was required.

In addition, 14 new viruses have surfaced from various parts of the world. Of the 14 viruses, two appear to be fairly virulent. The Joshi virus, from India, is a boot sector and partition table infector which activates on the 5th of January. When activated, it locks up the machine and displays the message "Type Happy Birthday Joshi". The system stays locked until the user types the happy birthday message. In addition the virus causes problems in writing to or reading from 1.2Mb diskettes. The second virus is from Taiwan and has been named the Taiwan-3 virus. It infects EXE and COM files, including COMMAND.COM. It is memory resident and randomly appears to garble the File Allocation Table of the hard drive. Both viruses have been reported at multiple sites.

The twelve additional viruses are outlined in the enclosed VIRLIST.TXT file. For a detailed description of each, please refer to Patricia Hoffman's VSUM document.

The V800 virus has been added to the list of viruses that can be removed without deleting the infected programs.

Version 63: Version 63 has been one of the most painful versions we have put together. There have been 17 new viruses and virus sub-strains discovered in the 35 days since the release of version 62. We have also added a major feature to allow SCAN and CLEAN-UP to check inside of programs compressed with LZEXE; we've added Yankee Doodle and Vacsina to the list of recoverable viruses in CleanUp; we've undertaken an accounting of the numerous sub-strains of each virus; we've repaired over a dozen loopholes that allowed certain sub-strains to slip through; and we've added a new program to the product line called VCOPY that replaces the DOS copy command and does automatic scanning during a copy function.

In addition, we've been struggling with the issue of how to count viruses in a meaningful way that does not place us in a seemingly disadvantageous competitive position. For example: Numerous anti-virus programs advertise the number of viruses that they are able to detect, and these numbers range from less than 50 to over 100. On analysis, these numbers included all of the known sub-strains of the viruses, and their virus count by our classification was always substantially less. We group viruses by major type, where possible, to make it easier to manage, both from an identification and removal basis. But on a sheer numbers comparison, SCAN appears in a weaker light. After careful thought, we decided to stick with our classification scheme, but in the VIRLIST.TXT we will list the known variants detected in parentheses. By the competition's counting scheme, we now identify 167 viruses. By our count, we identify 97.

The 17 new viruses and new sub-strains added for version 63 have come from a variety of sources. Vesselin Bontchev from Bulgaria submitted three new variants of the 512, one new variant of the W-13 virus and two entirely new viruses that have surfaced in Eastern Europe. Dave Chess from IBM provided me with three new viruses collected through the various IBM contacts. Patricia Hoffamn provided one new virus and two new variants submitted from users of the FidoNet network. The Icelandic virus researcher Fridrik Skulason provided one new virus. The remaining four were submitted directly by Homebase users. The VIRLIST.TXT document describes the main operating characteristics of the new viruses. To avoid duplication of effort, I am referring users to Patricia Hoffman's most current VSUM document for a detailed description of the new viruses.

VIRUS CHARACTERISTICS LIST V67

408 988 3832

The following list outlines the major characteristics of the known IBM PC and compatible virus strains identified by SCAN. The number of known varients of each virus is also listed. This number is listed in parenthesis beside the name of the strain. The total number of known viruses is summed at the end of the list. The Clean-Up virus I.D. code is included in brackets.

```
======================================================================

Infects Fixed Disk Partition Table--------------------+
Infects Fixed Disk Boot Sector--------------------+ |
Infects Floppy Diskette Boot --------------------+ | |
Infects Overlay Files---------------------------+ | | |
Infects EXE Files------------------------------+ | | | |
Infects COM files-----------------------------+ | | | | |
Infects COMMAND.COM--------------------------+ | | | | | |
Virus Remains Resident----------------------+ | | | | | | |
Virus Uses Self-Encryption-----------------+ | | | | | | | |
Virus Uses STEALTH Techniques-------------+ | | | | | | | | |
                                          | | | | | | | | | |     Increase in
                                          | | | | | | | | | |      Infected
                                          | | | | | | | | | |     Program's
                                          | | | | | | | | | |        Size
                                          | | | | | | | | | |          |
```

Virus	Disinfector	V	V	V	V	V	V	V	V	V	V	V		Damage
Casper [Casper]	Clean-Up	.	x	.	x	x	.	.	.	.	.	1200		L,O,P,D
1605 [1605]	Clean-Up	.	.	x	x	x	x	.	.	.	.	1605		L,O,P,D
Violator [Vio]	Clean-Up	.	.	.	x	x	.	.	.	.	.	1055		O,P,D
*Blood-2 [B-2]	Clean-Up	.	.	.	.	x	.	.	.	.	.	427		O,P,D
Wisconsin [Wisc]	Clean-Up	.	x	.	x	x	.	.	.	.	.	825		O,P,D
Christmas-J [C-J]	Clean-Up	.	.	x	x	x	x	.	.	.	.	600		O,P
*Burger [Burg]	Clean-Up	.	.	.	x	x	x	.	.	.	.	560		O,P,D
*Leprosy-B [Lepb]	Clean-Up	.	.	.	x	x	x	.	.	.	.	Overwrites		
Whale [Whale]	Clean-Up	x	x	x	x	x	x	x	.	.	.	9216		L,O,P,D
Invader [Invader]	Clean-Up	.	x	x	.	x	x	x	x	x	.	4096		B,L,O,P,D
Scott's Valley [Sval]	Clean-Up	.	x	x	.	x	x	x	.	.	.	2133		L,O,P,D
Black Monday [BMON]	Clean-Up	.	.	x	x	x	x	x	.	.	.	1055		L,O,P,D
Nomenclature [Nom]	Clean-Up	.	.	x	x	x	x	x	.	.	.	1024		O,P,D
Anthrax - Boot [Atx]	M-Disk	.	.	x	.	.	.	.	.	.	x	N/A		O,P,D
Anthrax - File [Atx]	Clean-Up	.	.	x	x	x	x	.	.	.	.	1206		O,P,D
651 [651]	Clean-Up	.	.	x	.	x	.	.	.	.	.	651		O,P,D
Paris [Paris]	Clean-Up	.	.	.	x	x	x	x	.	.	.	4909		O,P,D,L
*Leprosy [Lep]	Clean-Up	.	.	x	x	x	x	x	.	.	.	Overwrites		
Mardi Bros. [Mardi]	M-DISK	.	.	x	.	.	.	.	x	x	.	N/A		B,O

1253 - Boot [1253]	M-DISK	. . x . . . . x x x	N/A	O,P,D,L
1253 - COM [1253]	Clean-Up	. . x x x	1253	O,P,D,L
AirCop [AirCop]	M-DISK	. . x . . . . x . .	N/A	B,O
*400 (5) [400]	Clean-Up	. . x . x	Vary	O,P,D
P1 (3) [P1r]	Clean-Up	. x x . x	Vary	O,P,D,L
Ontario [Ont]	Clean-Up	. x x x x x	Vary	O,P,D
1226 (3) [1226]	Clean-Up	. x x x x x x . . .	1226	O,P,D
V2100 [2100]	Clean-Up	. . x . x x	2100	O,P,D,L
Plastique (3) [Plq]	Clean-Up	. . x x x x x . . .	3012	O,P,D
Wolfman [Wolf]	Clean-Up	. . x x x x	2064	O,P
Doom2 [Dm2]	Clean-Up	. . x . x x	2504	O,P,D,L
Flip [Flip]	Clean-Up	. x x x x x x . . .	2343	O,P,D,L
Fellowship [Fellow]	Clean-Up	. . x . . x	1022	O,P,D,L
Flash [Flash]	Clean-Up	. . x x x x	688	O,P,D,L
1008 [1008]	Clean-Up	. x x x x	1008	O,P,D,L
Stoned-II [Stoned]	M-DISK	. . x . . . . x . x	N/A	O,B,L
Taiwan3 [T3]	Clean-Up	. . x x x x x . . .	2905	O,P,D,L
Armagedon [Arma]	Clean-Up	. . x x x	1079	O,P
1381 [1381]	Clean-Up	. . . . . x x . . .	1381	O,P
Tiny (7) [Tiny]	Clean-up	. . . x x	163	O,P
Subliminal [Sub]	Clean-Up	. . x x x	1496	O,P
Sorry [Sorry]	Clean-Up	. . x x x	731	O,P
RedX [Redx]	Clean-Up	. . . x x	796	O,P
1024 [1024]	Clean-Up	. . x x x	1024	O,P
Joshi [Joshi]	M-DISK	x . x . . . . x x x	N/A	B,O,D
Microbes [Micro]	M-DISK	. . x . . . . x x .	N/A	B,O,D
Print Screen [Prtscr]	M-DISK	. . x . . . . x x .	N/A	B,O,D
Form [Form]	M-DISK	. . x . . . . x x .	N/A	B,O,D
July 13th [J13]	Clean-Up	. x . . . x	1201	O,P,D,L
*5120 (2) [5120]	Clean-Up	. . . x x x x . . .	5120	O,P,D,L
Victor [Victor]	Clean-Up	. . x x x x x . . .	2458	P,D,L
JoJo [JoJo]	Clean-Up	. . x . x	1701	O,P
W-13 (2) [W13]	Clean-Up	. . . . x	532	O,P
Slow [Slow]	Clean-Up	. x x . x x x . . .	1721	O,P,L
Frere Jacques [Frere]	Clean-Up	. . x . x x x . . .	1811	O,P
Liberty [Liberty]	Clean-Up	. . x x x x x . . .	2862	O,P
Fish-6 [Fish]	Clean-Up	x x x x x x x . . .	3584	O,P,L
Shake [Shake]	Clean-Up	. . x . x	476	O,P
Murphy [Murphy]	Clean-Up	. . x x x x x . . .	1277	O,P
V800 [V800]	Clean-Up	x x x . x	none	O,P,L
Kennedy [Kennedy]	Clean-Up	. . x . x	308	O,P
8 Tunes/1971 [1971]	Clean-Up	. . x . x x x . . .	1971	O,P
Yankee - 2 [Doodle2]	Clean-Up	. . . . x x	1961	O,P
June 16th [June16]	Clean-Up	. . . x x	1726	F,O,P,L
XA1 [XA1]	Clean-Up	. x . . x	1539	F,O,P,L
1392 [1392]	Clean-Up	. . x x x x	1392	O,P,L
1210 [1210]	Clean-Up	. . x . x	1210	O,P,L
1720 [1720]	Clean-Up	. . x . x x x . . .	1720	F,O,P,L
Saturday 14th [Sat14]	Clean-Up	. . x . x x x . . .	685	F,O,P,L
Korea (2) [Korea]	M-DISK	. . . . x x .	N/A	B,O
Vcomm (3) [Vcomm]	Clean-Up	. . . . . x	1074	O,P,L

ItaVir [Ita]	Clean-Up	. . . . . x	3880	O,P,L,B
Solano (2) [Solano]	Clean-Up	. . x . x	2000	O,P,L
V2000 (3) [2000]	Clean-Up	. . x x x x x . . .	2000	O,P,L
1559 [1559]	SCAN/D	. . x x x x	1554	O,P,L
512 (4) [512]	SCAN/D	x . x x x	none	O,P,L
EDV (2) [EDV]	M-DISK	x . x . . . . x x x	N/A	B,O
*Joker [Joke]	Clean-Up	. . x x x		O,P
Icelandic-3 [Ice-3]	Clean-Up	. . x . . x	853	O,P
*Virus-101 [101]	Clean-Up	. x x x x x x x . .	2560	P
1260 [1260]	Clean-Up	. x . . x	1260	P
*Perfume (2) [Fume]	Clean-Up	. . . . x	765	P
Taiwan (2) [Taiwan]	Clean-Up	. . . . x	708	P
Chaos [Chaos]	MDISK	. . x . . . . x x .	N/A	B,O,D,F
*Virus-90 [90]	Clean-Up	. . x . x	857	P
Oropax (3) [Oro]	Clean-Up	. . x . x	2773	P,O
4096 (2) [4096]	Clean-Up	x . x x x x x . . .	4096	D,O,P,L
Devil's Dance [Dance]	Clean-Up	. . x . x	941	D,O,P,L
*Amstrad (5) [Amst]	Clean-Up	. . . . x	847	P
Payday [Payday]	Clean-Up	. . x . x x x . . .	1808	P
*Datacrime II-B [Crime-2]	Clean-Up	. x . x x x	1917	P,F
Sylvia/Holland [Holland]	Clean-Up	. . . . x	1332	P
*Do-Nothing [Nothing]	Clean-Up	. . x . x	608	P
Sunday (2) [Sunday]	Clean-Up	. . x . x x x . . .	1636	O,P
Lisbon (2) [Lisb]	Clean-Up	. . . . x	648	P
*Typo/Fumble [Typo]	Clean-Up	. . x . x	867	O,P
*Dbase [Dbase]	Clean-Up	. . x . x	1864	D,O,P
Ghost Boot [Ghost]	MDISK	. . x . . . . x x .	N/A	B,O
Ghost COM [Ghost]	Clean-Up	. . . . x	2351	B,P
New Jerusalem [Jeru]	Clean-Up	. . x . x x x . . .	1808	O,P
*Alabama (2) [Alabama]	Clean-Up	. . x . . x	1560	O,P,L
Yank Doodle (3) [Doodle]	Clean-Up	. . x . x x	2885	O,P
2930 [2930]	Clean-Up	. . x . x x	2930	P
Ashar [Brain]	Clean-Up	. . x . . . . x . .	N/A	B
*AIDS (3) [Aids]	Clean-Up	. . . . x	Overwrites	
Disk Killer (2) [Killer]	Clean-Up	. . x . . . . x x .	N/A	B,O,P,D,F
*1536/Zero Bug [Zero]	Clean-Up	. . x . x	1536	O,P
MIX1 [Ice]	Clean-Up	. . x . . x	1618	O,P
Dark Avenger (2) [Dav]	Clean-Up	. . x x x x x . . .	1800	O,P,L
3551/Syslock [Syslock]	Clean-Up	. x . . x x	3551	P,D
VACSINA (2) [Vacs]	Clean-Up	. . x . x x x . . .	1206	O,P
Ohio [Ohio]	MDISK	. . x . . . . x . .	N/A	B
Typo Boot [Typo]	MDISK	. . x . . . . x x .	N/A	O,B
Swap Boot [Swap]	MDISK	. . x . . . . x . .	N/A	B
*Datacrime II [Crime-2]	Clean-Up	. x . . x x	1514	P,F
*Icelandic II [Ice-2]	Clean-Up	. . x . . x	661	O,P
Pentagon [Pentagon]	MDISK	. . . . x . .	N/A	B
*Traceback (2) [3066]	M-3066	. . x . x x	3066	P
Datacrime-B [Crime-B]	Clean-Up	. x . . x	1168	P,F
*Icelandic (2) [Ice]	Clean-Up	. . x . . x	642	O,P
Saratoga [Ice]	Clean-Up	. . x . . x	632	O,P
*405 [405]	Clean-Up	. . . . x	Overwrites	

1704 Format [170x]	Clean-Up	. x x . x	1704	O,P,F
Fu Manchu (2) [Fu]	Clean-Up	. . x . x x x . . .	2086	O,P
Datacrime (2) [Crime]	Clean-Up	. x . . x	1280	P,F
1701/Cascade [170x]	Clean-Up	. x x . x	1701	O,P
CASCADE-B (9) [170x]	Clean-Up	. x x . x	1704	O,P
Stoned (2) [Stoned]	Clean-Up	. . x . . . . x . x	N/A	O,B,L
1704/CASCADE [170x]	Clean-Up	. x x . x	1704	O,P
Ping Pong-B (2) [Ping]	Clean-Up	. . x . . . . x x .	N/A	O,B
Den Zuk (3) [Zuk]	MDISK	. . x . . . . x . .	N/A	O,B
Ping Pong (3) [Ping]	Clean-Up	. . x . . . . x . .	N/A	O,B
Vienna-B [Vienna]	Clean-Up	. . . . x	648	P
Lehigh [Lehigh]	Clean-Up	. . x x	Overwrites	P,F
Vienna/648 (14) [Vienna]	M-VIENNA	. . . . x	648	P
Jerusalem-B [Jeru]	Clean-Up	. . x . x x x . . .	1808	O,P
Alameda (2) [Alameda]	Clean-Up	. . x . . . . x . .	N/A	B
Friday 13th COM [Fri13]	Clean-Up	. . . . x	512	P
Jerusalem (9) [Jeru]	Clean-Up	. . x . x x x . . .	1808	O,P
SURIV03 [SurivB]	Clean-Up	. . x . x x x . . .		O,P
SURIV02 [SurivA]	Clean-Up	. . x . . x	1488	O,P
*SURIV01 [SurivA]	Clean-Up	. . x . x	897	O,P
Brain (3) [Brain]	Clean-Up	. . x . . . . x . .	N/A	B

Total Known Viruses - 223

LEGEND:

* * Extinct Viruses (Viruses that are research only viruses, or have not been reported in the public domain for more than 12 months.)

Damage Fields -

B - Corrupts or overwrites Boot Sector
O - Affects system run-time operation
P - Corrupts program or overlay files
D - Corrupts data files
F - Formats or erases all/part of disk
L - Directly or indirectly corrupts file linkage

Size Increase - The length, in bytes, by which an infected program or overlay file will increase
Characteristics - x - Yes - No.

Disinfectors - SCAN/D - VIRUSCAN with /D option
SCAN/D/A - VIRUSCAN with /D and /A options
MDISK/P - MDISK with "P" option
All Others - The name of disinfecting program

NOTE: The SCAN /D option will overwrite and then delete the entire infected program. The program must then be replaced from the original program diskette. If you wish to try and recover an infected program, then use the named disinfector if available.

APPENDIX B
PAM ERROR MESSAGES

Appendix B contains a brief description of the Priority Assessment Model(PAM) message severity levels, a comprehensive list of PAM messages, and a brief description of the cause and possible remedies for each message.

1. PAM Message Severity Levels

The PAM issues the following five general types of messages:

(1) Informational Messages,
(2) Warning Messages,
(3) Moderate Messages,
(4) Severe Error Messages, and,
(5) System Error Messages.

The types of messages are differentiated by the error's severity and the need and/or capacity for PAM to recover once the error is encountered. Each general category of message is discussed below.

Informational Messages

Informational messages do not inherently indicate an error has occurred during PAM execution. Information messages simply convey information of interest to the model user. Because informational messages do not by themselves indicate a PAM error has occurred, they carry no implications for the computational correctness of the PAM results and do not require a user response.

Warning Messages

Warning level messages indicate an error may have occurred. Warnings alert the user to unusual circumstances or assumptions the model made in place of missing "non-critical" data. Model users should assess the implications of the model warnings before using the PAM results.

Moderate Error Messages

Moderate error messages indicate an error has occurred that has prevented the model from performing the complete facility evaluation requested. Moderate errors are not severe enough to completely halt the PAM model computations and the model will recover and complete as much of the evaluation as possible. The user should examine the error messages and correct the errant condition if possible.

Severe Error Messages

Severe error messages indicate that the PAM model execution failed. The cause of the failure, however, is most likely a result of incorrect data or user error. In most cases the user will be able to make adjustments and rerun the PAM successfully.

System Error Messages

System errors messages indicate that the PAM model execution failed. Further, the cause of the error is system related and will probably require assistance from a CR-ERNS/PAM system programmer.

2. PAM Messages

Informational Messages

010001 **Pam execution halted due to preceding error.** The model cannot recover from the error immediately preceding this message. Consult the preceding error message in either the PAM message file (PAM_____.MSG) or the PAM detailed report (PAM_____.DTL) for more information on the fatal error.

010002 **PAM execution halted due to preceding error.** This message is the same as 010001 (see above). The message id number, (010001 vs. 010002) indicates the logical route in PAM's error handling module and is of interest to system programmers for diagnosing PAM system errors.

010003 **The following source is a surface water release to a lake. The PAM currently does not evaluate risks associated with releases to lakes.** Evaluating releases to lakes is beyond the current scope of the PAM. Sources with releases to lakes are skipped during PAM execution and are not considered in the model's facility evaluation.

Warning Messages

020001 **Aggregate cancer risk over all sources exceeds 1.0 for current chemical.** The aggregate cancer risk resulting from releases to air is greater than one for the current chemical. The cancer risk for the air medium will be reported as 1.0.

020002 **Calculated cancer risk exceeds 1.0 for the current chemical.** The computed cancer risk for the current chemical and source of releases to air is greater than 1.0. The risk will be reported as 1.0.

020003 **Current chemical has no data for Cancer Potency Factor and Reference Dose.** The current chemical is missing toxicity data in the Chemtox data base. Effects for this chemical cannot be calculated and will not be considered in the PAM facility evaluation.

020004 **No weather stations found within 500 Km of facility lat, long coordinates.** The calculated distance between the facility being evaluated and the nearest weather station exceeds 500 kilometers. This result may be correct, but the user should verify the latitude and longitude coordinates of the current facility. Because the distance between the facility and the weather station is great, the evaluation of effects caused by releases to air should be used with caution.

020005 **Surface area for air release given as 0. (m); 0.01 (m) used by Priority Assessment Model.** The current source has area releases to air but the surface area of the release is recorded as 0.0. The model has substituted a small surface area (0.01 m2), appropriate for small point releases such as a single valve, pipe fitting etc., and completed the dispersion calculations. The user verify the surface area for the release. If the "small" surface area assumption is incorrect the user should correct the surface area entry for the source and rerun the PAM.

020006 **Error opening echo file for weather station data (STARDATA.OUT). Contact system support.** A system file used for echoing and verifying the weather station data base cannot be accessed by the PAM. The PAM will execute correctly, however, PAM users should contact system support so that the model's internal testing procedure can be turned off.

020007 **Aggregate cancer risk over all sources exceeds 1.0 for current chemical.** The aggregate cancer risk resulting from releases to surface water is greater than one for the current chemical. The cancer risk for the surface water medium will be reported as 1.0.

020008 **Surface water velocity is 0; downstream concentration and risk cannot be calculated.** The current source has releases to a stream, but stream velocity is recorded as 0. The model will calculate initial mixing concentrations, but will not be able to calculate downstream concentration. Because the facility evaluation is based on initial contaminant concentration the PAM facility results are not affected by the missing stream velocity data. If downstream concentration results are desired the user should correct the stream velocity data and rerun the PAM.

020009 **Surface water concentration too low to be calculated (<10e-65). Concentration set to 0.** The predicted concentration of contaminants in surface water for the current are too low (below 1.e-65) for the model to calculate and are set to 0. Because the concentration is analytically indistinguishable from zero the model results are unaffected. While calculated concentrations below 1.e-65 may be correct, they may also indicate a data error for quantity of release, stream flow, or the chemical specific surface water decay rate. The user should verify this data before using the model results.

020010 **Calculated cancer risk exceeds 1.0 for the current chemical.** The computed cancer risk for the current chemical and source of releases to surface water is greater than 1.0. The risk will be reported as 1.0.

020011 **The average wind speed for the nearest weather station is reported as zero in the STARDATA.BIN data file. A default wind speed of 0.01 m/s will be used in the air dispersion calculations.** The reported average wind speed for the nearest weather station is zero. The air dispersion computation cannot accept zero and uses a very small wind speed (0.01 meters/second) which closely approximates the dispersion for a wind speed of zero. Because an average wind speed report of zero is suspect, the current facility's evaluation results for the air medium should be used with caution.

Moderate Error Messages

030001 **Hydraulic conductivity of aquifer or regional gradient is zero; time of transport cannot be calculated.** Hydraulic conductivity or regional gradient data is missing from the Soildata data base. Contaminant time of transport in groundwater cannot be calculated for the current facility. The facility evaluation will be based on sources with releases to air and surface water only.

030002 **Annual recharge rate is 0. Time of transport cannot be calculated.** Annual recharge rate data is missing from the Soildata data base. Contaminant time of transport in groundwater cannot be calculated for the current facility. The facility evaluation will be based on sources with releases to air and surface water only.

030003 **Saturated hydraulic conductivity is 0. Time of transport cannot be calculated.** Saturated hydraulic conductivity is missing from the Soildata data base. Contaminant time of transport in groundwater cannot be calculated for the current facility. The facility evaluation will be based on sources with releases to air and surface water only.

030004 **Unsaturated zone porosity is 0. Time of transport cannot be calculated.** Unsaturated zone porosity is missing from the Soildata database. Contaminant time of transport in groundwater cannot be calculated for the current facility. The facility evaluation will be based on sources with releases to air and surface water only.

030005 **ALI in database is 0. for current chemical, cancer risk not calculated.** The current chemical is a radionulcide, but has no value for annual limit of intake in the Chemtox data base. Risk for this chemical cannot be calculated, and will not be considered in the PAM facility evaluation.

030006 **Surface water flow is 0; concentration and risk cannot be calculated.** Stream flow is zero for the current source. Concentration and subsequent effects cannot be calculated and will not be included in the PAM facility evaluation. The user should enter the correct stream flow and rerun the PAM for this facility.

030007 **Current chemical has no data for Cancer Potency Factor, Reference Dose, or Water Quality Criteria.** The current chemical is missing toxicity data in the Chemtox data base. Effects for this chemical cannot be calculated and will not be considered in the PAM facility evaluation.

Severe Error Messages

040001 **No weather stations found within 1000 Km of facility lat, long coordinates.** No weather stations in the Stardata data base are within 1000 kilometers of the current facility. The user should verify the latitude and longitude coordinates for the current facility.

050001 **Unable to locate failing routine in PAM routine and offset list. Contact system support.** The CR-ERNS/PAM system error message module is unable to locate message data for a PAM subroutine. The system is installed incorrectly or the supporting data file (PAMFUNC.V01) has been damaged after installation. The user should contact system support for assistance.

050002 **Error opening PAM message library file (PAMMESS.) Contact system support.** The PAM was not able to find or open the data file containing the library of system messages(PAMMESS.V01). The system is installed incorrectly or has been damaged after installation. The user should contact system support for assistance.

050003 **Unable to retrieve data from PAM message library. Contact system support.** The PAM cannot access the data file containing the library of system messages(PAMMESS.V01). The message library or its supporting data file (PAMFUNC.V01) have been altered after installation. The user should contact system support for assistance.

050004 **Invalid data retrieved from PAM message library. Contact system support.** The PAM cannot correctly messages from the library of system messages. The message library or its supporting data file (PAMFUNC.V01) have been altered after installation. The user should contact system support for assistance.

050005 **Unexpected end of PAM.INP while locating evaluation criteria. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. The user should check storage space on disk designated for PAM input. If this disk is full, clear space and use CR-ERNS to respecify the facilities to be evaluated by PAM. If the disk is not full, or the problem persists contact system support for assistance.

050006 **Unexpected end of PAM.INP while locating evaluation criteria. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050007 **Unexpected end of PAM.INP while reading evaluation criteria. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050008 **Unexpected end of PAM.INP data file, no data records read. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050009 **Unexpected end of PAM.INP file at input level 2. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050010 **Run date not found in PAM.INP file. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050011 **Unexpected end of PAM.INP file at input level 4. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050012 **Unexpected end of PAM.INP file at input level 5. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050013 **Cannot retrieve facility name and address data. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050014 **Unexpected end of PAM.INP file at input level 7. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050015 **Cannot retrieve facility latitude and longitude data. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050016 **Unexpected end of PAM.INP file at input level 9. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050017 **Cannot retrieve data for air related constants. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050018 **Cannot retrieve data for air exposure distances. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050019 **Cannot retrieve data for receptor height and temperature. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050020 **Unexpected end of PAM.INP file at input level 13. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050021 **Unexpected end of PAM.INP file at input level 14. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050022 **Cannot retrieve data for surface water flow and velocity. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050023 **Unexpected end of PAM.INP file at input level 16. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050024 **Cannot retrieve data for unsaturated zone parameters. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050025 **Cannot retrieve data for saturated zone parameters. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050026 **Unexpected end of PAM.INP while locating source data Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050027 **Unexpected end of PAM.INP while locating source description. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050028 **Unexpected end of PAM.INP while reading media affected by release. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050029 **Invalid media affected. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050030 **Error opening STARDATA.BIN data file. Contact system support.** The PAM cannot locate or access the weather station data file(STARDATA.BIN). The system is installed incorrectly or has been damaged after installation. Contact system support for assistance.

050031 **Unexpected end of PAM.INP at substance level. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050032 **Unexpected end of PAM.INP while reading substance data. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050033 **Unexpected end of PAM.INP while reading substance data. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050034 **Error opening PAM routine and offset file (PAMFUNC.) Contact system support.** The CR-ERNS/PAM system is unable to locate or access one of its supporting data files (PAMFUNC.V01). The system is installed incorrectly or has been damaged after installation. Contact system support for assistance.

050035 **Unexpected end of PAM routine and offset file. Contact system support.** The CR-ERNS/PAM system is unable to access one of its supporting data files (PAMFUNC.V01). The system is installed incorrectly or has been damaged after installation. Contact system support for assistance.

050036 **Number of routines listed in PAM routine and offset file exceeds allowable maximum. Contact system support.** The PAM internal system definitions do not match an existing message module data file. The system is installed incorrectly or has been damaged after installation. The user should contact system support for assistance.

050037 **Error opening PAM execution log (PAMxxxxx.MSG.) Contact system support.** The PAM cannot write model run results. The user should check storage space on the disk designated for PAM output. If this disk is full, clear space and use CR-ERNS to respecify the facilities to be evaluated by PAM. If the disk is not full, or the problem persists, contact user support for assistance.

050038 **Error opening PAM.INP facility data input file. File does not exist or data path is invalid. Contact system support.** The PAM cannot access the input file created by the CR-ERNS information system. The user should confirm that the file path designated for PAM input exists and that the designated disk is not full. Create the path or clear space as necessary and use CR-ERNS to respecify the facilities to be evaluated by PAM. If the disk is not full, or the problem persists contact system support for assistance.

050039 **Error opening PAM.DTL detailed results output file. File already exists or output path is invalid. Contact system support.** The PAM cannot write model run results. The user should check storage space on the disk designated for PAM output. If this disk is full, clear space and use CR-ERNS to respecify the facilities to be evaluated by PAM. If the disk is not full, or the problem persists contact user support for assistance.

050040 **Error opening PAM temporary air media output report file (RESULTS.) Contact system support.** A system file used for echoing and verifying the weather station data base cannot be accessed by the PAM. The PAM will execute correctly, however, PAM users should contact system support so that the model's internal testing procedure can be turned off.

050041 **Unexpected end of PAM.INP at air source level. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050042 **Unexpected end of PAM.INP while reading air release source type. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050043 **Unexpected end of PAM.INP while locating stack data.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050044 **Unexpected end of PAM.INP while reading stack data. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050045 **Unexpected end of PAM.INP while locating area data. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050046 **Unexpected end of PAM.INP while reading area data. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050047 **Invalid air source id; must be 1 or 2 (1 = stack, or 2 = area).** The facility data input file created for the PAM by the CR-ERNS information system is incomplete or incorrect. See message id number 050005 for appropriate user responses.

050048 **Error opening PAMPATHS.v* facility run request file. Contact system support.** The PAM model cannot locate or access the file of facility evaluation requests generated by the CR-ERNS information system. The system is installed incorrectly or has insufficient storage space on the disk designated by the CR-ERNS system path in the default drives menu. If this disk is full, clear space and use CR-ERNS to respecify the facilities to be evaluated by PAM. If the disk is not full, or the problem persists contact user support for assistance.

050049 **Unexpected end of PAMPATHS.v* facility request file. Contact system support.** The file of facility evaluation requests generated by the CR-ERNS information system for PAM is incomplete. The system is installed incorrectly or has insufficient storage space on the disk designated by the CR-ERNS system path in the default drives menu. If this disk is full, clear space and use CR-ERNS to respecify the facilities to be evaluated by PAM. If the disk is not full, or the problem persists contact user support for assistance.

050050 **Unexpected end of PAM.INP while reading surface water data. Contact system support.** The facility data input file created for the PAM by the CR-ERNS information system is incomplete. See message id number 050005 for appropriate user responses.

050051 **Error opening PAM.SUM summary results output file. Contact system support.** The PAM cannot write model run results. The user should check storage space on the disk designated for PAM output. If this disk is full, clear space and use CR-ERNS to respecify the facilities to be evaluated by PAM. If the disk is not full, or the problem persists, contact user support for assistance.

050052 **No air stability class frequency is greater than 0 for closest weather station found in STARDATA.BIN data file. Contact User Support.** The meteorological data is incomplete for the nearest weather station. This error may indicate the weather station data file has been damaged after installation. Contact system support for assistance.

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